DECEMBER 6, 1954

NEWS ISSUE

Electrical World

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A McGRAW-HILL PUBLICATION

In Boise

Idaho Power Co's inventory-control plan proves a success ...page 16

and below the border

Troubleshooter Draper is bringing a bright future to Mexican Light & Power Co

...page 30

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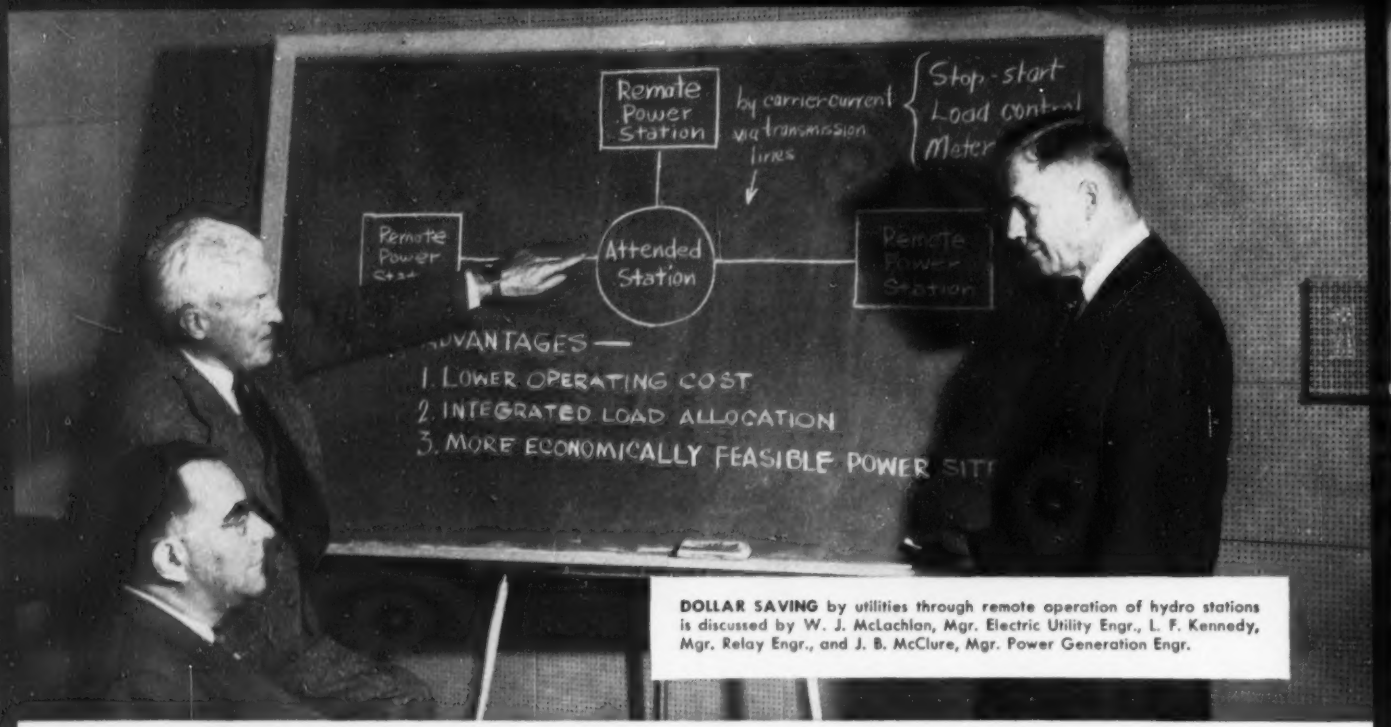


DOLLAR SAVING by utilities through remote operation of hydro stations is discussed by W. J. McLachlan, Mgr. Electric Utility Engr., L. F. Kennedy, Mgr. Relay Engr., and J. B. McClure, Mgr. Power Generation Engr.

Increasing fuel, labor costs...

Spur trend to automatic hydrostations

Rising costs of labor and fuel, dependability of control equipment, and high operating flexibility are giving new impetus to the trend to automatic hydro-electric power plants.

NEW SITES, CONVERSION ON UP SWING

The move is evident in the growing number of new plants now being equipped with automatic control. And the trend shows clearly in the conversion of existing manually operated plants on the one hand and in the development of marginal hydro-sites for automatic operation on the other. Many marginal sites which manual control costs would render uneconomic become feasible through automatic control.

OPERATING ECONOMIES MARKED

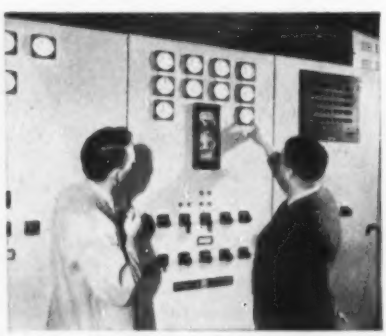
At Stewarts Bridge, N. Y., for example, General Electric engineers helped meet equipment specifications for the world's largest single-unit, fully automatic station. Here, Niagara Mohawk Power Corp. is finding that after higher installed costs, the expense of maintaining the 37,500 kva station is practically nil. Capitalizing on Type 20 Carrier Current control, which permits signal transmission right on the power line, the station can be brought on the line, controlled, metered and shut off from a central point six miles away.

When reviewing system operating costs, utilities can profit from consideration of automatic, remotely controlled hydro-electric stations. High accuracy equipment now available makes them more attractive than ever. For full data on how automatic hydro-electric plants can help reduce over-all system operating costs, write to General Electric Company, Section 301-276, Schenectady 5, New York.

MORE POWER TO AMERICA

GENERAL ELECTRIC

WORLD'S LARGEST single-unit, fully automatic hydro-electric station of Niagara Mohawk Power Corp. at Stewarts Bridge, N. Y. is General Electric equipped, rated 37, 500 kva.

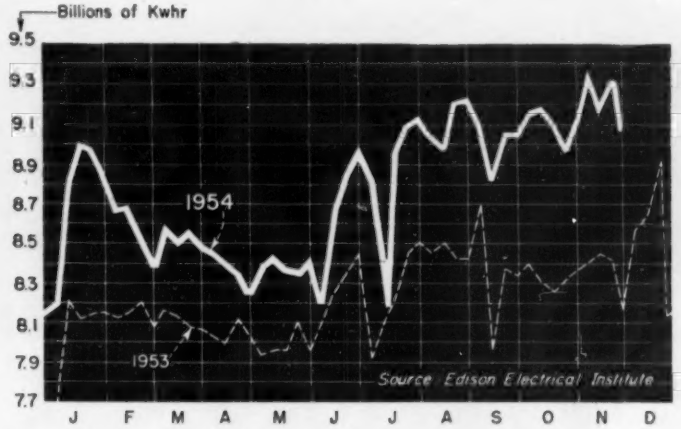


TYPE 20 CRYSTAL CARRIER CURRENT used for first time at Stewarts Bridge controls by signal over power transmission line. Three functions can be sent, received independently.

HIGH OPERATING FLEXIBILITY reaches peak since hydro-electric plant can be brought on the line automatically in a matter of minutes to meet daily load changes.

Electrical World

Vol 142 No 23 December 6, 1954



Output Week Ended Nov. 27—9,087,000,000 Kwhr

Per Cent Change from Previous Year

	Total US	New Eng.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific NW	Pacific SW
Nov. 27	+11.7	+5.4	+5.3	+9.4	+3.1	+23.3	+11.1	+7.5	+5.6	+8.9
Nov. 20	+10.7	+3.6	+4.9	+8.5	+3.5	+21.7	+10.5	+6.3	+5.8	+7.0
Nov. 13	+8.7	+1.4	+2.5	+4.8	+2.3	+19.1	+11.5	+5.3	+6.6	+7.5

Seasonally Adjusted Index †173.9* Week Ago 173.2 Year Ago 157.1

Electric Power Statistics

		Latest Month	Preceding Month	Year Ago
Peak Load ‡(Million Kw)	Sept.	79.4	79.7	74.4
Capacity (Million Kw)	Sept.	99.16	98.08	87.59
Production (Billion Kwhr)	Sept.	39.55	41.17	37.03
Hydro	Sept.	7.80	8.34	7.59
Fuel	Sept.	31.74	32.82	29.44
Fuel Consumption:				
Coal (Million Tons)	Aug.	9.83	9.40	9.71
Oil (Million Barrels)	Aug.	4.85	4.45	6.54
Gas (Billion Cu Ft)	Aug.	130.49	127.37	112.88
Sales (Billion Kwhr)	Sept.	34.05	33.88	32.64
Residential	Sept.	9.76	9.65	8.55
Commercial	Sept.	6.69	6.66	5.90
Industrial	Sept.	15.00	14.89	15.67
Other	Sept.	2.60	2.68	2.51
Net Income Class A & B Companies ($ Million)	Aug.	89.43	84.44	77.24
Estimated Dec. '54 Peak ‡(Million Kw)	Sept.	87.8	88.0	91.2
Kwhr per Residential Customer (12 Month Average)	Sept.	2,496	2,476	2,302
Revenue per Kwhr Residential Service (12 Month Average)	Sept.	2.70¢	2.71¢	2.75¢
Canadian Production (Billion Kwhr)	Sept.	5.51	5.45**	5.09

Business Statistics

FRB Industrial Production Index†	Oct.	129	126	136
Gross National Product Annual Rate ($ Billion)	3rd Qtr.	355.5	356.0	367.2
EW 4 Industry Production Index†	Oct.	116.6	116.0	124.0
ENR Construction Cost Index††	Nov.	134.8	134.6	128.1
BLS Consumer's Price Index	Oct.	114.5	114.7	115.4
NEMA Insulation Materials Sales Index†	Sept.	123	111	153
NEMA Electric Appliance Sales Index†	Sept.	115	91	102
NEMA Household Refrig. Sales Index†	Sept.	73	71	62

*Preliminary **Revised ‡Class 1 Systems †1947-49=100 ††1949=100

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SELF-SUPPORTING ALL THE WAY FROM 3 TO 300 KV

This exclusive feature of Thorex lightning arresters effects major savings in design and installation, and stabilizes electrical grading at higher operating voltage levels

Wet test for internal electrical grading being conducted in the O-B High Voltage Laboratory on a Thorex MPR lightning arrester rated at 300 kv, for system operating voltages up to 375 kv.

★ Only support required for Thorex lightning arresters is a simple foundation. Elaborate structures and insulated bracing are eliminated. These design and installation expenses can easily exceed the cost of the arrester units, themselves.

★ Un-desirable distortion of proper voltage division between arrester units can be introduced by bracing or supporting insulators. This is the result of surface leakage currents over the insulators connected at intermediate points in the arrester stack. Freedom from such intermediate support characterizes the complete Thorex lightning arrester range, from 3 to 300 kv.

★ Simplified design permits radical reduction of station space requirements for the Thorex.

★ These are *three more* sound reasons for specifying Thorex lightning arresters--three more reasons added to the best all-around protection your money can buy!

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THE ELECTRICAL WEEK

The Issue's News Highlights . . . Michigan PSC authorizes the use of reserve accounting on fast depreciation.

FPC staff backs Idaho Power on Hells Canyon.

GE makes organization changes on executive level.

Correction . . . Hydroelectric potential of New England-New York area totals 5 million kw and not 5 million kw a year as reported in EW, Nov. 22, p 10. This figure includes projects with minimum benefit cost ratio of 0.6. See In the Industry on page 10.

Consolidated Edison Co of NY is employing Vitro Corp of America as consulting engineers in field of atomic energy. Pres H. R. Searing says "as we draw closer to the application of atomic energy in the production of electric power, we have decided to go outside our organization for specially qualified technical aid." Vitro engineers will aid Con Edison in adapting atomic fuel to electric power generation.

Sign of the Atomic Age: New York, believed to be first state to take such action, has revised the state Sanitary Code to incorporate radiological control. Revision, effective July, 1955, covers such things as disposal of radioactive materials, according to Earl Devendorf, N. Y. state sanitary engineer . . . On the subject of radioactivity, Manson Benedict, member of the Advisory Committee on Reactor Safeguards of AEC, provides utilities with a thought to ponder: A 100,000-kw nuclear power reactor would contain 10 billion lethal doses of radioactive material.

D. P. Barnard, deputy assistant secretary of defense for research and development, belittled possibility of using solar energy for human needs at last week's ASME annual meeting. Trouble with solar energy, he said, is that it arrives at the earth's surface at too low a temperature and is not continuously available.

Minneapolis-Honeywell Regulator Co, Philadelphia, announces an all-electronic load and frequency control with servo circuits and continuous high speed telemetering. This system is being shown for the first time at the power show in Philadelphia this week.

Indiana & Michigan Electric, IBEW-AFL, and District 50-UMW agree to 3% wage increase . . . Joint Crafts Council at Seattle rejects wage increase offer ranging up to $15 a month for employees of City Light and other city departments. Council is composed of 21 AFL unions.

Kansas City P&L announces 12-year program for constructing 800 Mw generating plant to cost $125 million . . . Ohio Power acquires 650 acres near Ironton as site for future 1 million-kw generating plant.

Off the Washington Wire . . . FPC has revised eight schedules of annual report FPC Form No. 1, required of Class A and B electric utilities and licensees, for simplicity and clarification. Amendments become effective Dec. 31 for filing of annual reports beginning with 1954.

Inter-Industry Farm Electric Utilization Council will hold two-day workshop at Sheraton Hotel, St Louis, Feb. 3-4 to map further plans for aiding state and local groups in their efforts to boost on-farm electric use. Council is composed of two members from electric companies, two from co-ops, and two from electric equipment companies. Deputy REA Administrator Fred Strong is nonvoting chairman. Council is not an REA organization.

Mississippi Valley Generating's financing plan came up for consideration by SEC last week. Among the pro-public power protestants at the hearings was Memphis City Light, Gas and Water Division which is considering a plant of the same capacity, the power to be sold to TVA. Memphis, which gets all its power from TVA, would buy back its needs. Finally, City Light is conferring with Walter von Tresckow, New York financier, whose alternative proposal to the MVG plan was turned down.

Preference customers can count on sufficient federal power in the Pacific Northwest until 1965, but not so private distributors, according to Dr William A. Pearl, Bonneville Power administrator. "Private distributors can look to the federal government to take care of their minimum year requirements without using steam only until 1958. After that, power from existing projects and those under construction will be available in decreasing amounts as preference customers, with rapidly growing loads, take larger and larger share of supply," he says.

Ohio PUC approves new electric rates for Central Ohio P&L which will cut $250,000 a year from customers' bills. New schedule is in line with rates of Ohio Power into which Central will merge . . . Pacific G&E Dec. 1 effected electric and gas rate reductions of about $568,000 a year.

Executive Changes . . . J. D. Howard, assistant to operations vice president of Wisconsin Power & Light, was elected vice president in charge of engineering, system operations and maintenance . . . Long Island Lighting Co's newly elected vice presidents are John J. Tuohy and Howard B. Wakeman.

Regular News Services

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Reserve Accounting for Fast Depreciation Allowed in Michigan for Detroit Edison

JOHN H. McCARTHY

Michigan Public Service Commission has authorized Detroit Edison Co to use the "Sum of the Years-Digit Method" in computing depreciation allowances for tax purposes. The commission's Nov. 5 order is the first ever issued by any commission on this subject. John H. McCarthy is chairman of the Michigan PSC.

The reserve method of accounting for the federal income tax deferrals arises from the accelerated depreciation provisions of Section 167 of the Internal Revenue Code of 1954.

The effect of using the SYD method, the company petition to the PSC said, was to reduce the tax liability in the first half of the estimated service life of the property and increase the tax liability over and above the straight line method in the second half of the service life.

The company petition which requested "reserve accounting" noted that the commission had "by order dated Aug. 8, 1951, specifically prescribed the method of accounting for the federal income tax results of accelerated amortization (or depreciation) of the cost of certain facilities under the provisions of Section 124A of the Internal Revenue Code of 1939 (Section 168 of the Internal Revenue Code of 1954) which are the same in nature as the federal income tax results of accelerated depreciation (or amortization) under said Section 167."

The PSC, in its order authorizing the company to use accelerated depreciation for tax purposes, said that:

1. "During the period when the annual allowances for depreciation of properties under Section 167 (b) (3) are more than what would be the allowances for normal income tax depreciation of such properties under said Section 167 (b) (1), to charge to 'Provision for Deferred Federal Income Taxes Arising Out of Section 167, I. R. C.' as a separate subaccount under Account 507—Taxes, and to credit to 'Reserve for Deferred Federal Income Taxes—Section 167, I. R. C.' as a separate subaccount under Account 258.2—Miscellaneous Reserves, an amount for each year equal to the reduction in federal income taxes payable for that year due to the fact that allowances for accelerated depreciation (or amortization) of properties pursuant to said Section 167 (b) (3) are in excess of what would be allowable for normal income tax depreciation under Section 167 (b) (1) of the Internal Revenue Code of 1954.

2. "During the period when the allowances for depreciation of properties under said Section 167 (b) (3) are less than what would be allowable for normal income tax depreciation, to charge to 'Reserve for Deferred Federal Income Taxes—Section 167, I. R. C.' and to credit to 'Portion of Current Federal Income Taxes Deferred in Prior Years' as a separate subaccount under Account 507—Taxes, an amount for each year equal to the increase in federal income taxes payable for that year due to the fact that allowances for accelerated depreciation (or amortization) of properties under Section 167 (b) (3) for that year are less than the amount that would be allowable for normal depreciation under said Section 167 (b) (1)."

It is of considerable interest that during the hearings on the company's petition, Thomas E. Hurns, general accountant of Detroit Edison Co, stated that the liberalized methods can be applied to the mass property of the company.

As to the cost of money of these deferrals, the following significant facts were brought out in the direct examination of Hurns.

"Q. But the benefit which accrues to the taxpayer, in this case Detroit Edison Co, is that it does represent a saving in the cost of money?

"A. That's right.

"Q. By reason of the fact that you retain in the company the tax savings instead of paying it to the Commissioner of Internal Revenue in the form of taxes?

"A. That's right."

Discussing the normalizing of taxes at the income level and the fact under such procedure present rates will not change, Hurns stated that "now as far as future rates are concerned, there will be the advantage of getting this money without having to pay interest for it and it might benefit future ratepayers inasmuch as we don't have to borrow so much money."

PSC Commissioner W. B. Elmer cross-examined Hurns, as follows:

"Commissioner Elmer: Here is another question I have, Mr Hurns. This special reserve for deferred income tax, does the company characterize that as cost free capital?

"A. As cost free capital?

"Commissioner Elmer: Yes.

"A. Well, it is a liability with a long maturity and like any other accounts payable, we don't pay interest on it."

FPC STAFF BACKS IDAHO POWER ON HELLS CANYON PLAN

Commission's counsel, John C. Mason, makes strong recommendation favoring three low dams

Idaho Power Co has won a major battle in its fight for a Federal Power Commission license to build with private funds three low dams on the Hells Canyon stretch of the Snake River in Idaho.

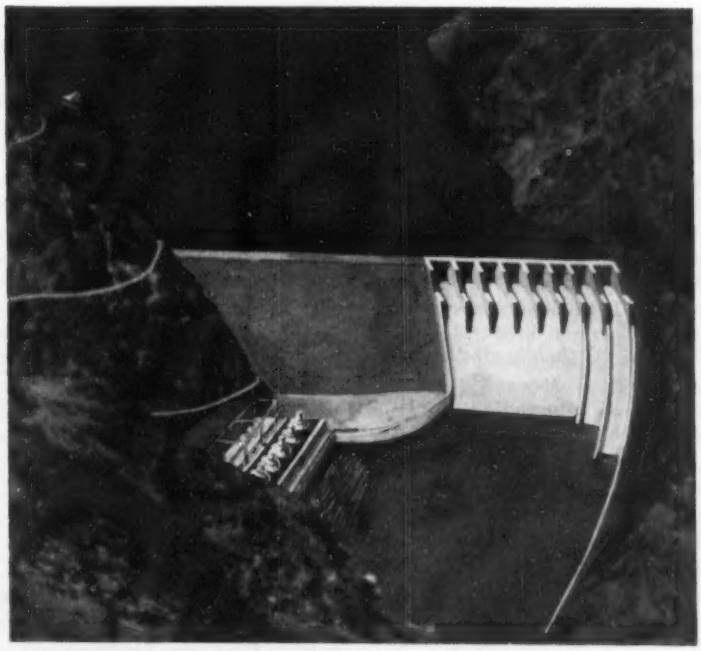
For months the company argued its case in hearings before FPC Examiner William Costello. Then on Nov. 24, FPC's staff, which appeared as experts at the hearings but which had not before revealed its thinking on the application, submitted its recommendations to Costello. It presented a strong brief in favor of the private utility's application—so strong a case, in fact, that Washington experts are convinced that Costello would have a difficult job deciding against private development of the river.

These experts predicted the commission, too, would decide within a few months to approve the application, in view of the fact that three of the commissioners are Republicans, one is an Independent, and the other is an "Eisenhower Democrat."

This is the first time the utility has received direct government support for its application. Many months ago, Interior Department under the new Administration withdrew its earlier objection to private development, and this helped Idaho Power's case. FPC experts testified during the dreary months of hearings, but they did not officially endorse the plan until now.

Idaho Power and the intervenors filed their first briefs Nov. 24. But these for the most part summarized earlier arguments. Briefly, in recommending issuance of a license to Idaho Power for its three-dam plan, rather than consideration of a single high dam, or a two-dam development program, this is what the FPC staff found and recommended:

- Idaho Power should be required to construct Brownlee, Oxbow, and low Hells Canyon projects in that order.
- Assuming financing, construction, and operation by the same agency, no one plan of the three alternative plans has a substantial economic superiority over the other two plans for development considered for the Hells Canyon stretch of the river.
- Assuming financing, construction, and operation by the same agency, the high Hells Canyon project in the one-dam plan would make possible the production of the greatest amount of power—and power that's economic. But the projects in the two-dam and three-dam plans would make possible the development of the cheapest power in economic amounts. The cost of the added power which would be provided by the one-dam plan over the other two plans would cost almost as much as its value . . . that is, it would cost almost as much to produce as you could get for it.
- Brownlee, Oxbow, and low Hells Canyon projects as proposed by Idaho Power would utilize the head and



Low Hells Canyon Dam (above) and two others proposed by Idaho Power win support of FPC's Mason

stream flow in an adequate manner.

- The proposed projects could and would be operated to provide flood control storage and navigation benefits.
- Estimated construction cost, exclusive of interest during construction, of the Brownlee, Oxbow, and low Hells Canyon projects in the amount of $175,766,000 is reasonable.
- The total dependable capacity of 767,000 kw that would be provided at the three dams would be fully utilized in the applicant's own system by about 1975 and in the Northwest area about as soon as it could be developed if indicated arrangements with other systems can be firmed up.
- The applicant has shown ability to finance the projects.
- Applicant should coordinate operation of its proposed projects and its power system with the Northwest Power Pool.
- The three developments should be considered as units of the complete project and authorized by one license.
- The rate of return on the net investment, and the proportion of surplus earnings to be paid into and held in amortization reserves, are reasonable.

Special Conditions Set . . . The commission staff, under the direction of staff counsel John C. Mason, set forth 18 special conditions under which it felt the license should be issued to the private power firm.

One of these established construction deadlines for each of the low dams. It recommended that building of Brownlee begin within a year of the effective date of the license, and that it be completed within 36 months. It said Oxbow should begin within four years, and be completed within another 24 months. And it advised commencement of construction on low Hells Canyon within six years, and completion within another 36 months.

Idaho Power had asked for five years as the period during which construction should begin on all three, but it had not specified which of the units would be started first.

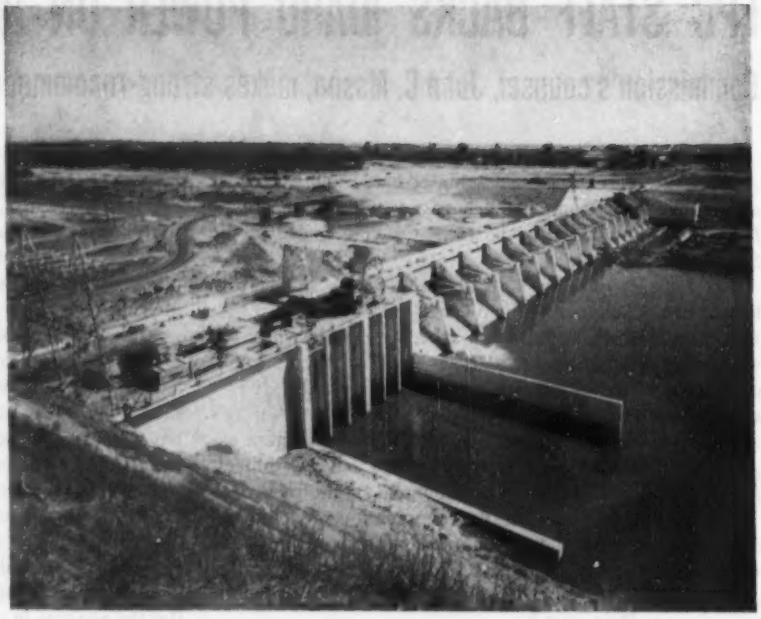
Another condition of the license as recommended by the staff would require clearing and disposal of all lands under the high water mark. Another would provide payment of annual charges to the government.

The Cost . . . In discussing the company's ability to finance the project, the staff said the construction program calls for capital expenditure of $191,328,000 for the three dams, plus $45,274,500 for transmission facilities, $79,245,700 for substations, distribution and general facilities — a total of $315,848,200. Assuming that the construction program is scheduled so that the initial unit goes into operation by 1957, the staff said, the average annual capital expenditure would be $20 million. And assuming a net cash generation of about 30%, the average annual financing requirement would be about $14 million. "Idaho Power Co should have no problem in obtaining funds for such a construction program," the staff said.

Following are specifications for each of the projects, including capacity:

	Brownlee	Oxbow	Low Hells Canyon
Head (ft)	277	117	208
Reservoir (miles)	57.5	11.5	22.7
Installed Capacity (kw)	360,400	151,000	272,000
Peaking Capacity (kw)	414,400	173,600	312,800

Each would be a rock-fill dam, with reinforced concrete slab on the upstream face. They would be connected with the company's system and the Northwest Pool through 230-kv transmission lines. Their individual rated water capacities would be 18,000 cfs, and for maximum plant capability, 20,700 cfs. At-site energy would be 501,000 average kw of firm energy, plus 57,000 average kw of secondary energy. Estimated annual value of the power output at market is $36,066,000; estimated annual at-market cost of the power output is $27,921,000, inclusive of annual cost of fish facilities.



Nimbus Dam Construction Work Finished

Construction firms have finished their work on the $6,067,000 Nimbus Dam and power plant on the American River near Sacramento, Calif. The project, to serve as an afterbay to the larger Folsom Dam upstream, will be completed after a clean-up job. The power plant, which will have a 13,500-kw capacity, will be operated as a unit of the Central Valley Project, under supervision of the Bureau of Reclamation. The dam, completed ahead of schedule, is 800 ft long and 46 ft in height above the stream bed.

Philo Plant Expansion

Construction of a new 120,000-kw steam-electric generating unit at its Philo Plant near Zanesville will get underway this month, Ohio Power Co has announced. The new unit will boost Philo Plant's capacity to 510,000 kw.

GE Makes Major Shifts

Pres Ralph J. Cordiner has announced major changes in General Electric Co's organization at the executive office level. The changes include:

Formation of the Distribution Group composed of the Apparatus Sales Division, General Electric Supply Co, International General Electric Co, and General Electric Credit Corp. The Affiliated and Foreign Companies Group is discontinued.

Appointment of Executive Vice Pres Henry V. Erben as group executive in charge of the new Distribution Group and of Executive Vice Pres Robert Paxton to succeed Erben as group executive in charge of the Apparatus Group. Canadian General Electric Co becomes a part of the Apparatus Group.

Election of John W. Belanger as an executive vice president and appointment of Belanger as group executive in charge of the Industrial Products and Lamp Group, replacing Paxton. The X-Ray Department becomes a part of the Industrial Products and Lamp Group.

Changing of the name of the Defense Products Group to the Atomic Energy and Defense Products Group and assignment of group executive responsibility to Vice Pres Cramer W. LaPierre, who succeeds Belanger.

Formation of the Distribution Group, Cordiner said, represents another significant step in the decentralization and integration of company operations initiated in 1951.

New Group's Objectives

The new group, according to Cordiner, has been formed for the purpose of achieving "improved customer service, better service to the operating departments using these sales channels, and more clearly defined management responsibility."

It was stressed that formation of the new group does not alter the present relationships between distributors and the operating components or their responsibilities regarding each other.

Assignment of Erben as group executive of the Distribution Group brings to the post a man who has long experience in the sales field as well as in the operating phase of GE's apparatus business. Erben was appointed a commercial vice president of GE in 1944 and a year later was named assistant general manager of the Apparatus Department. He was elected a vice president and general manager of apparatus in 1948 and executive vice president in 1951.

During his GE career, Paxton, new group executive for the Apparatus Group, has been in direct charge of two of the major heavy equipment businesses which help make up the group. He served in the switchgear business from 1924 to 1945 and in the transformer business from 1945 until his election as vice president in charge of manufacturing in 1950.

As successor to Paxton as executive vice president of the Industrial Products and Lamp Group, Belanger transfers from the Defense Products Group, which he has headed since its formation in 1952. A GE employee for nearly 38 years, Belanger became manager of its Turbine Divisions in 1947, assistant general manager of the Apparatus Department in 1949, and general manager of the Large Apparatus Business in 1951.

LaPierre, who assumes group executive responsibility of the Atomic Energy and Defense Products Group, also will continue as general manager of the Aircraft Gas Turbine Division which, together with Atomic Products Division and Aeronautic and Ordnance Systems Division, will comprise the group.

Group responsibilities for the Appliance and Electronics Group remain under Executive Vice Pres Roy W. Johnson.

PICTURES: General Electric officials involved in executive organization changes are (from top to bottom): Henry V. Erben, Robert Paxton, John W. Belanger, and Cramer W. LaPierre

IN THE INDUSTRY

What New England Hydropower Study Is All About

Potential undeveloped hydro power available in New England and New York State was claimed to be about 5 million kw total by Col Benjamin B. Talley, chairman of New England-New York Inter-Agency Committee, rather than the 5 million kw annually as reported (EW, Nov. 22, p 10). This figure was arrived at through investigations the committee is making of 28 river basins in the northeastern area.

Even the 5 million kw does not represent the power that can be economically developed at present. It is the power from projects that have a minimum benefit cost ratio of 0.6 or greater. Benefit-cost ratio is the ratio of the total annual cost of supplying power from the cheapest alternate source, usually a modern fuel electric plant, to the annual cost of providing the same amount of power to the same load by the proposed hydro project.

Depends on Ratio . . . Therefore, the amount of power that can be economically developed now would be restricted to projects having a benefit cost ratio of 1.0 or more. No break down has been made of these projects in the investigation reports, but it is reported to be less than ½ million kw excluding the St. Lawrence and Niagara projects.

Purpose of the investigations is to determine the power potential of 28 river basins in New England and New York State including projects that are under construction but not yet operating. Electric utilities have cooperated by supplying data.

When completed, the reports will not recommend construction of any project at any time by any interest. Instead, they are supposed to serve as a guide to comprehensive river basin development.

The reports for the seven states will present estimated costs of projects taking account of their economics and limitations, such as possible markets and relation to present generating capacity. Cost for flood control and wildlife protection will be included where justified. However, such costs will affect only a few projects. Private financing is assumed for estimates of all projects, and all costs are based on 1949 figures.

From Five Rivers . . . Using the benefit cost ratio of 0.6 the committee has determined that approximately 1,850 Mw of untapped power is available in New England. Of this amount, 1,250 Mw could be derived from the Androscoggin, Kennebec, Aco, Penobscot, and St. John Rivers as well as the Maine coastal area not including the Passamaquoddy Project. Most of the other 600 Mw is from the Connecticut and Merrimack River basins in the southern New England States.

In New York State estimated figures indicate that there is approximately 3,000 Mw of undeveloped hydro power projects having a benefit cost ratio of 0.6 or more. Most of this is attributed to the St. Lawrence Project and redevelopment of the Niagara River. St. Lawrence has been authorized by Congress to be 940 Mw, and the Niagara redevelopment will add approximately 1,500 Mw more.

It is difficult to see why publicity is being given to the claimed 5 million kw figure which is based upon an arbitrary 0.6 benefit cost ratio. Certainly, if any of the projects have a 0.6 benefit cost ratio today, the chances are that they will remain uneconomic for many years.

Of course, the historic "New Deal" method of evaluating hydro electric projects with steam have set up costs on the basis of hydro development with government financing and no taxes and steam developments with private financing and corresponding taxes. Fortunately, the New England-New York Inter-Agency Committee has wisely used private financing in both instances to arrive at the true economic cost comparison. The question of the use of the 0.6 benefit cost ratio remains to be answered.

TECHNICAL NOTES

ARCHER E. KNOWLTON

Excitation can be restored to a generator with minimum system disturbance if the system voltage has not been lowered excessively.

Over-refinement of transformer oils tends to form peroxides that damage solid insulation and acts also to accelerate the rate of oil breakdown.

Engineering design of stations and equipment should be such that the possibility of fires will be reduced to a minimum.

Aluminum foil in a 25-ft strip spread out on moistened ground (or in a wet ditch) serves as a temporary ground bed for making calculations of cathodic protection requirements. One half ohm is attainable, and conditions may stay stable for several hours.

Screen house could conceivably be consolidated with the power plant and circulators placed in the basement. Water would be taken from an open canal alongside the plant.

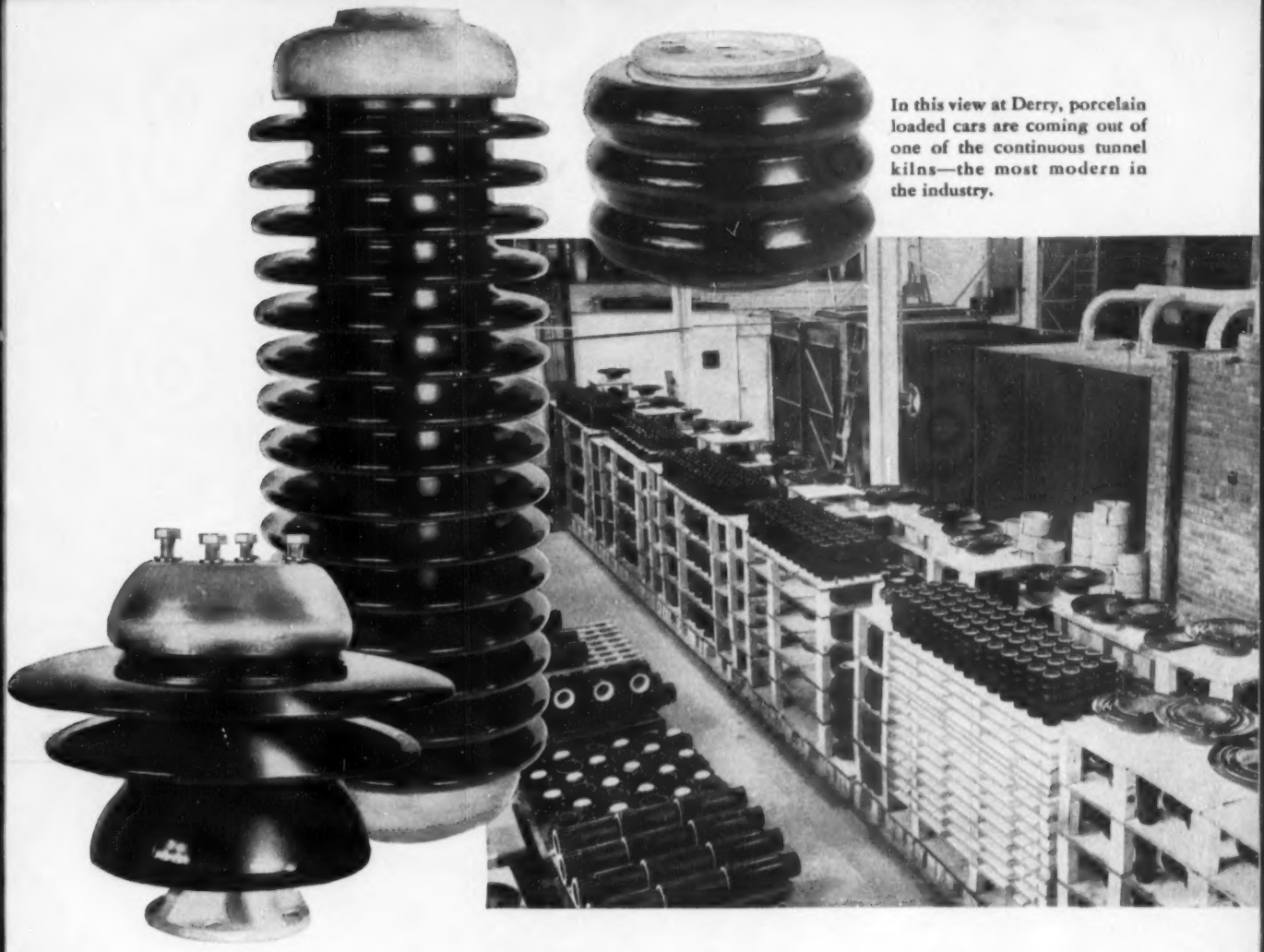
Positive prevention of galloping would permit higher conductor tensions, longer spans, and closer lateral spacing of conductors.

Un-fused potential transformer is preferable in a voltage regulator circuit of a turbine-generator because a blown fuse will lead to over excitation unless protection is provided to remove the regulator from service.

Soil electrolyte surrounding a buried pipe is not uniform in physical and chemical properties; cells of 0.2 to 0.5 v appear, with anodic portions usually found in the poorly aerated clay soils and the cathodic in well-aerated sandy soils.

Resonance was charged with the blowing of over 200 individual capacitor fuses when an associated breaker failed because of a mechanical condition.

Potential difference existing between clean iron and corroded iron will subject new pipe to corrosion if it is metallically connected to old corroded piping.



In this view at Derry, porcelain loaded cars are coming out of one of the continuous tunnel kilns—the most modern in the industry.

Insulator quality vital to apparatus performance

It's easy to overlook the importance of the apparatus insulators in the performance of Westinghouse switchgear. Insulators are such "taken-for-granted" components that we may forget what it takes to make good ones.

The answer is quality—quality that stems from vigorous research and development, up-to-date production facilities, skilled craftsmen and priceless know-how. Apparatus insulators made at the Westinghouse Porcelain Department at Derry, Pa., reflect the experience gained in a plant that produces the country's greatest variety of electrical porcelain.

These facilities and craftsmen (average 20 years' service) have sparked such outstanding advances as larger, one-piece, pin cap insulators; casting process for outdoor station post insulators; high-strength glazes; Prestite®; solder-sealing; pressed steel hardware and the first line of indoor apparatus insulators meeting the industry's basic impulse insulation level standardized requirements.

Westinghouse apparatus insulators include a complete line of outdoor pin cap and new BIL indoor types in all strengths and voltage ratings, as well as outdoor station post insulators in all standard strengths through 69 kv.

Proved insulator quality is one of many reasons why you can be sure of better performance—better value—with Westinghouse switchgear apparatus. Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-60867

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Leading the shift to new ASA standards with proved bushing design

The electrical industry has pushed toward constantly increasing standardization of equipment for reasons based on many sound operating economies. The recent ASA bushing standards are fresh evidence of this trend.

Westinghouse has recognized its responsibility to the industry in meeting these standards—with products of proved reliability—with the least amount of delay.

As a result, Westinghouse circuit breakers and transformers are the first available to the industry equipped with a bushing that fully meets the new standards. This bushing, the new Type S, retains the basic solder-sealed condenser construction backed by over 750,000 bushing years of service. It incorporates only minor dimensional changes over the previous design.

This quick response to industry needs is another record achievement of which we are proud and one which we believe reflects the long-term soundness of Westinghouse design aimed at meeting America's growing electrical load —economically—efficiently. J-97185

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Industry interchangeability reduces spare parts inventory

Type S condenser bushings, now available, are designed to meet ASA mechanical standards for 23 kv through 69 kv, 400- and 1200-ampere ratings.

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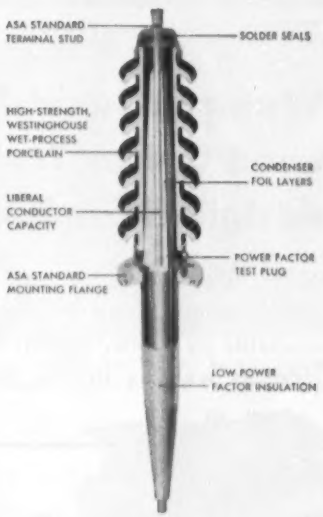
Condenser construction, pioneered by Westinghouse and backed up by over 50 years of experience, uniformly distributes voltage to prevent a concentration of stress at any one point. Complete hermetic seal, formed by soldering porcelain to flange and cap, eliminates all gaskets to assure a permanent seal against external contamination.



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Westinghouse manufactures condenser bushings, from stud to porcelain, under closely controlled conditions using the most modern techniques. For best service, be sure to insist on them when purchasing breakers or transformers.

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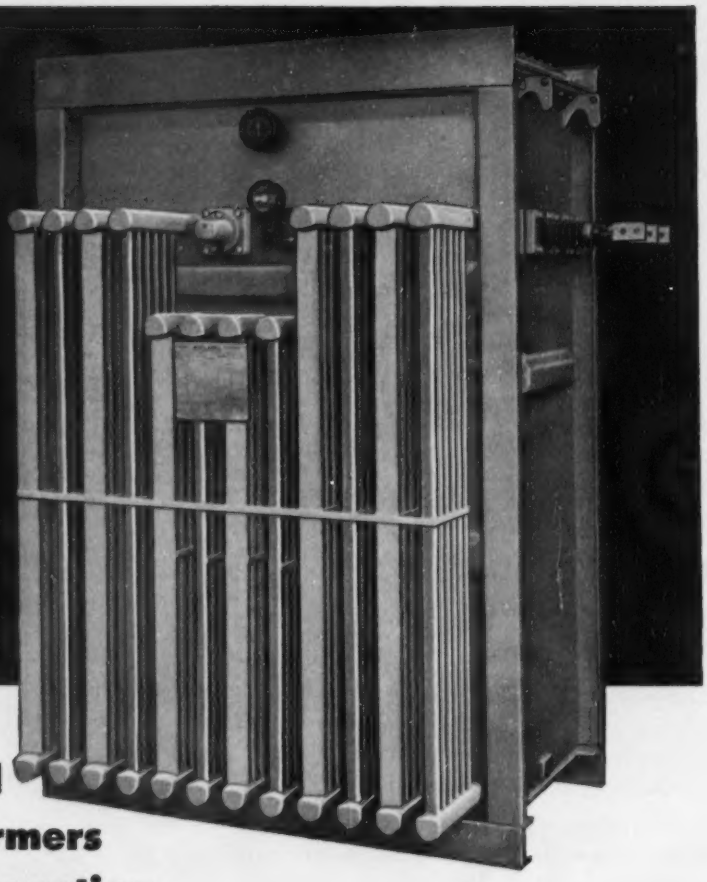

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Now, Wagner Noflamol (non-inflammable liquid-filled) Load Center Transformers are available in a new, improved close-coupled design, as well as in the standard throat-connected design. These transformers can be flush-mounted with any make of switchgear to form a neat, compact, streamlined unit substation for modern industrial service.

Wagner close-coupled transformers are available in ratings from 500 through 2000 kva. They are carefully designed to meet your distribution requirements.

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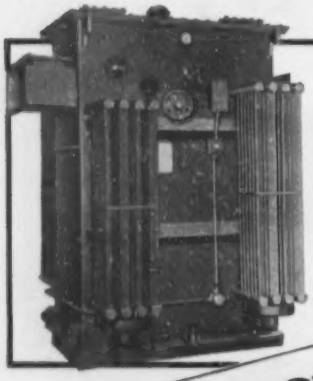

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For outdoor installation, or for applications where it is desirable to locate the transformer away from the switchgear, Wagner can furnish these liquid-filled transformers in ratings to 2000 kva, 15 kv and below. Bulletin TU-13 gives full information.

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T54-11

Two Groups Eye Farm Power Market

New Inter-Industry Council and older National Farm Electrification Conference seek to promote power utilization on farm

While the electrification of rural areas has gone on at a rapid pace, kilowatt-hour use on the individual farm has lagged behind use by other areas of the economy.

Two organizations—the recently organized Inter-Industry Farm Electric Utilization Council and the older National Farm Electrification Conference—aim in different ways to remedy this lag.

Last month in Schenectady, N. Y., where the Farm Conference held its annual session, the aims and accomplishments of the two organizations were spread before the some 110 conference participants. Fred Strong, deputy administrator of the Rural Electrification Administration and chairman of the Inter-Industry Council, described the aims and work of the new organization. The Farm Conference program and actions served to represent the contributions of the older one.

Adherents of both groups claim there is no sizeable conflict between them. Many are affiliated with both. The two organizations are out to promote rural load-building activities by encouraging farmers to use more electrical equipment and appliances. Each uses a different approach.

Aims . . . The Council, Strong explained, proposes to provide "nationally a driving force, designed both to stimulate and convert existing research, education, promotion, publicity, now going on, from the paper stage into the field of practical operation." With the enthusiasm of a still fresh organization, the Council has succeeded in drawing attention of top electric company and co-operative management. The National Association of Electrical Manufacturers has endorsed Council activities.

The Farm Conference, presently chairmanned by Karl Runkle, General Electric Co, is primarily an educational organization operating on an informal year-to-year basis. Its main activity has been to provide an annual forum for the diverse groups that have an interest in the promotion of electrical farming. For the past three years the conference steering committee has considered at length whether the Conference should be continued. At its meeting in November the steering group decided to hold a steering committee meeting next year but did not schedule a full-scale conference.

A number of Farm Conference participants informally indicated that the recently organized council may better serve the aims generally held by Conference members. They note, however, that the direct promotional activities sponsored by the council may deter several organizations from participation.

Accomplishments . . . Since its inception in March, the Council has sponsored a series of five area meetings throughout the country in an effort to dramatize the need for a sound load-building and power-use program and to set up local power-use committees by the cooperatives, electric companies, and manufacturers where none previously existed.

FARM GROUP CHAIRMEN MEET: NFEC's Karl Runkle, left greets Fred H. Strong of Inter-Industry Council at NFEC Schenectady sessions

In his Conference address Strong reported that a total of 2,000 persons attended the five area meetings. These led to the creation of 40 state committees for the purpose of organizing joint effort power-use programs.

The Council plans to act in an advisory capacity to these local committees, to serve as a coordinating group between them to foster the exchange of ideas and studies, and to make available information and advice from authorities in the field. A two-day workshop program will be held in February at St. Louis where the Council-backed committees will seek solutions for mutual problems.

NFEC, on the other hand, is not geared and was never intended to engage in this sort of intensive promotional activity. An attempt to expand Conference activity through the establishment of permanent working committees met with only partial success at the November meeting. The steering committee authorized three working

(*Continued on page 52*)

Empty warehouse bins and . . . new uses for salvage are . . .

Inventory Control Succeeds at Idaho

N. L. SCOTT, Purchasing Agent, Idaho Power Co, Boise, Idaho

An aggressive approach to inventory control enabled Idaho Power Co to cut its inventories by 40% since 1948. The money saved represents the cost of a substation with a transmission line thrown in for good measure. The inventory control project is still underway, but these benefits already have been gained:

1. Warehouses and yards no longer are congested, and outside storage has been decreased.
2. Annual inventory is completed easier and faster.
3. Materials move in and out of warehouses with less delay and cost.
4. Chances of obsolescence are reduced because smaller inventories are watched more closely.
5. Service to working crews from storekeepers is more prompt.

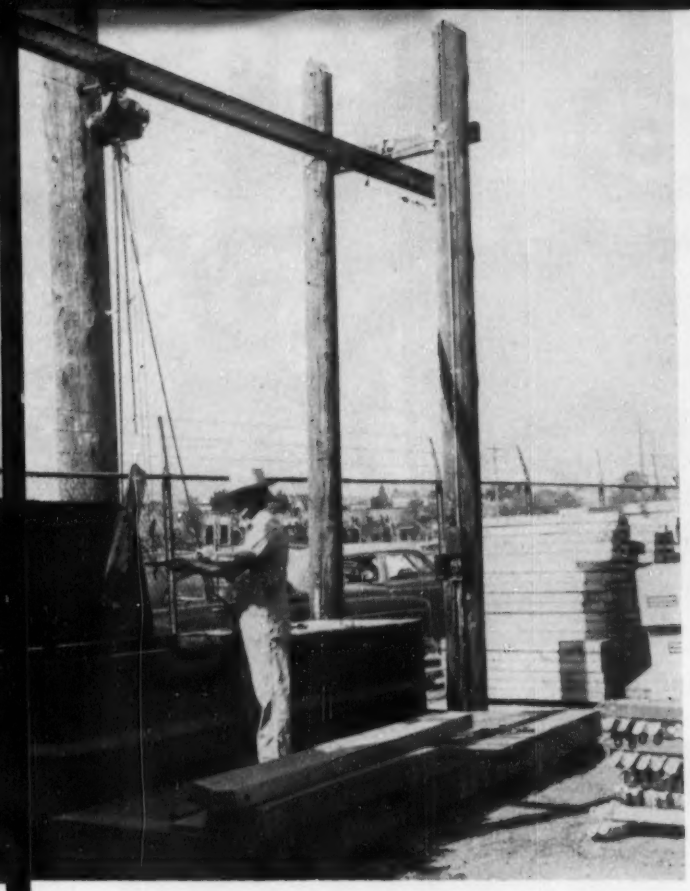
Distributors who supply Idaho Power report they have been able to improve their own turnover and carry more comprehensive stocks now that purchase orders are flowing regularly and more frequently than they did before the company adopted the new approach.

Four Avenues of Attack . . . Following the rapid postwar expansion, the company found itself with the highest inventories in its history. Coupled with the expansion, fears based on material shortages resulted in large accumulations of materials. Although construction activities were still in full swing, the purchasing department was instructed to reduce inventories as much as possible. A goal of a 50% reduction was set.

As the program developed, four rules emerged as important to the success of inventory reduction:

1. Rely on distributors for some of the less commonly used material.
2. Establish an inventory "yardstick."
3. Develop a card system devoted exclusively to inventory control at the local level.
4. Encourage field forces to scrap usable but unwanted material.

From the outset of the program careful consideration had to be given to sources of supply. The understanding of all personnel connected with the stocking and handling of materials also was necessary. The service area of the company is about 400 miles long by 300 miles wide. It lies



examples that prove . . .

Power Co

midway between Salt Lake City, Utah, and Portland, Ore. In 1948, only one major equipment distributor was well established in Boise, the headquarters city.

However, two more distributors were setting up operations there. With the enthusiastic cooperation of these three firms, local stocks were established to insure quick replenishment of supplies for the company. Experience showed that any one of the company's 37 field warehouses could be reached by common carrier within 24 hours.

Meters, transformers, and less commonly used materials were carried in stock for the company by other suppliers in Salt Lake, Portland, Seattle, Denver, and San Francisco. As supplies were established, it was found that these warehouses could ship almost any quantity of commonly used materials overnight for delivery to nearly all points in the company service area.

Fears of Scarcity Remain . . . However, the setting up of sources of supply was only the beginning. The effects of eight years of scarcity were not easily forgotten by those who depended upon materials in their daily operations. The first step was meeting the need for a dependable and acceptable yardstick by which to measure inventory during periods of fluctuating use. Turnover was the natural factor to use.

The measure of turnover was set deliberately low to allow for emergency maintenance materials and salvage accumulations. A four-month stock, or a turnover of three, was generally accepted as a reasonable goal. In a short time most division points exceeded this mark.

The next step to erase the fear of scarcity was the development of a card system devoted exclusively to inventory control at the local level. This system was installed at each of the five division warehouses. It consists of a simple visible record, posted daily, showing materials by quantity only. The record covers materials at each of the five to eleven stores points within the division. Turnover is apparent at a glance. With this tool, division storekeepers were able to keep abreast of rapidly changing requirements in their areas without piling up excess stocks.

From this point the reduction of current material stocks was rapid. The Korean War caused a temporary setback through a wave of "scare buying" which erased stocks in neighboring areas. This buying forced the company to plan long-range purchases in advance of engineering estimates to insure a supply of materials. But even in this situation the card system worked well, and inventories rose only moderately.

Scrap It if Possible . . . Putting the fourth factor—scrapping of old material—into effect was perhaps the most difficult step of all. Some materials had become obsolete because of advances in design. Loads had increased until higher distribution voltages and larger conductors were necessary. Reconstruction resulted in large accumulations of usable but unwanted salvage materials and supplies.

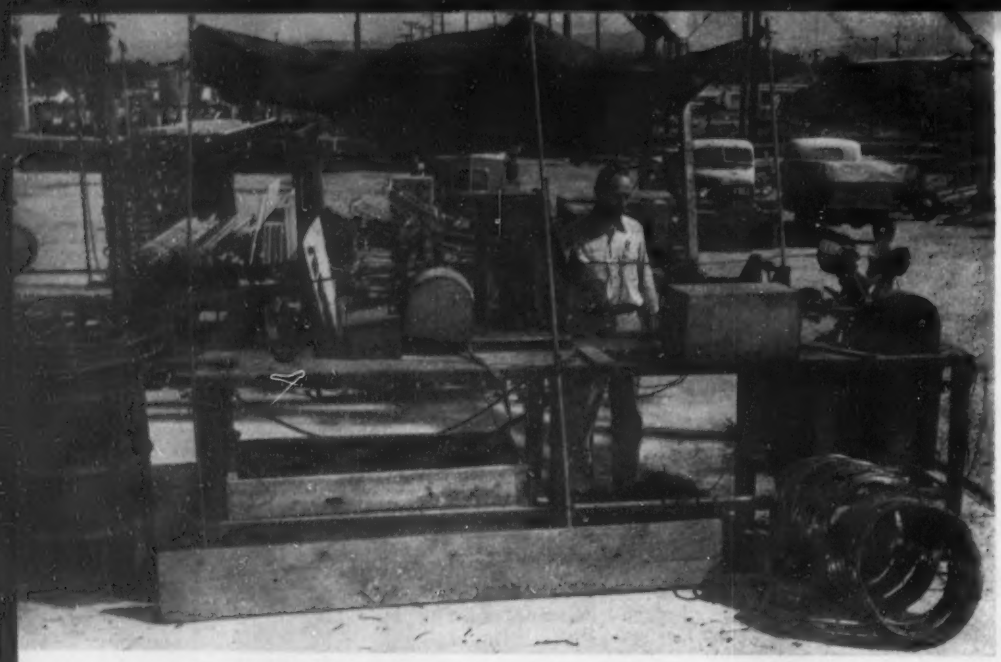
Company personnel readily understood that "purchased" materials can be a drain on the company. But salvaged equipment was something else again. This equipment either could be kept or thrown away. And no one wanted to throw away anything that was usable even though there was no apparent use for it at the time.

Inventory Cost is the Key . . . The decision was made to approach this problem right in the field by explaining what it cost to hold old and salvaged material. With full cooperation from operating and planning department heads, a task force took to the field. This group consisted of a responsible member from purchasing, the division chief clerk, the division superintendent of operations, and the storekeeper.

The program of getting rid of as much salvage as possible was explained in all details to the district manager and his foreman. Ideas were exchanged and requested from the field forces covering what to keep and what to discard. The district manager was left with a clear knowledge of his supply sources and of the cost of holding on to salvage.

During the visit of the task force, each item in district warehouses was examined as to condition and quantity. Damaged and obsolete equipment was scrapped on the spot. Inventories in excess of the turnover yardstick were shipped back to the division warehouse for use by the entire division. It was the explanation of costs that proved the most decisive in getting rid of unwanted salvage.

It is impossible to compute exact costs of carrying any specific item, but Idaho Power believes the average cost is about 12% annually. Thus, if an item cannot definitely be



Stripping weatherproof wire provides ground leads

More room because less stock is kept on hand

used within five years, it becomes advisable to scrap it, regardless of its source. Exceptions to this rule, of course, include "emergency breakdown" materials, such as power transformer bushings.

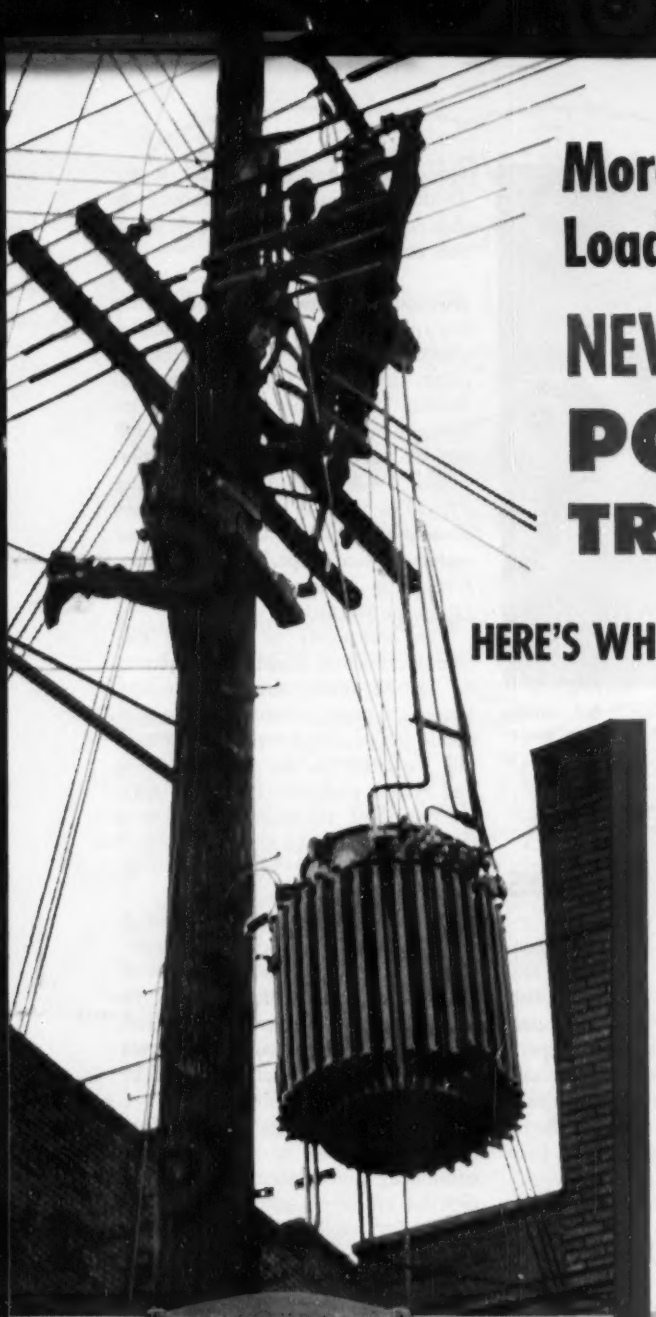
Company Gets Inventory Conscious . . . Following the field tours of the task force, personnel in the field became "inventory conscious," and ideas began to generate. Old 2.4-kv distribution transformers were rebuilt into 7.2-kv units. Sometimes it was possible to replace a burned-out 3-kva core with a more-needed 5-kva unit. A stock of obsolete 2-wire meters disappeared from a garage stall, and another car found shelter indoors.

Old pole stubs were cut up and treated for use as pole keys. "Whiskered" weatherproof wire was stripped and used as pole ground wire. Tag ends of large conductors were welded into ground grids for new sub-stations.

Reports from the districts of material to be scrapped were sent to a central information pool in the office of the purchasing agent at Boise. Through a review of these reports it was often possible to use surplus or scrap material in place of new material in other areas.

When all of the possibilities for use within the system were exhausted, there still remained some new and used materials for which no use could be found. The used materials were of no real value to the company, even though they had a book value, and they were scrapped eventually. All of the local suppliers and many of the secondary distributors volunteered to help move the new items to other areas. Through their combined efforts, a surprisingly large portion of these items were disposed of at little loss.

The inventory control project will continue into the future. The results to date have been most gratifying. And best of all, there is that extra substation and transmission line giving service to a lot of customers. They didn't cost a cent of added investment.



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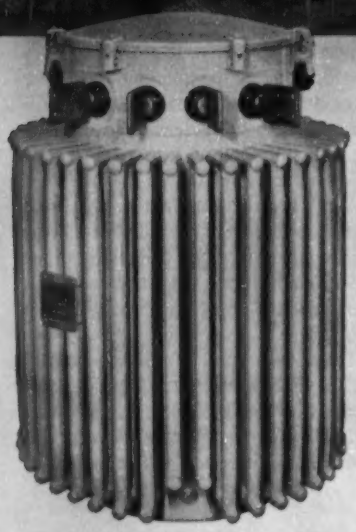

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WISCONSIN UTILITIES ASSOCIATION Vice Pres C. J. Forsberg, Wisconsin P & L, confers with Commissioner W. F. Whitney and Pres. H. P. Taylor, Wisconsin P S, before session

Sales, Engineering Leaders Convene at Wisconsin Utilities

A wide variety of engineering, operating and sales topics was discussed at the annual electric and gas convention of the Wisconsin Utilities Association at Milwaukee Nov 17-19. Significance of the Dixon-Yates controversy, status of atomic energy, distribution, mutual assistance under emergency conditions, microwave applications, time-payment wiring plans, and organizing for effective sales were a few of the topics.

Certain opponents of Dixon-Yates are not so much concerned about the terms as they are that privately financed plants will make unnecessary another tax-financed, government-owned steam plant, Pres. Harold P. Taylor of the association told the sales and technical groups. "Some opponents," said Taylor, "are against the Dixon-Yates contract because it interferes with their plans to socialize the public utility industry. The fight is . . . between those who would socialize American industry and those who believe in the good old American way of free enterprise."

Business men must tell what is happening in this country, said Charles Arps, Allis-Chalmers. "We should tell the people the part we play in our economy," he said.

Power Production . . . Safety and continuity of service are important features of the forced circulation boiler, said M. K. Drewry, Wisconsin Electric Power, in describing operating experience at Oak Creek plant. Drewry told how a boiler was kept in service during a peak load period several hours after developing a sizable leak in a tube.

Speaking on the status of atomic power, R. J. Petersdorf, also Wisconsin Electric Power, said the technology of the thermal converter reactor is well advanced but real competition lies in development of the breeder type. The ideal breeder would be one that burns the fuel it produces, he said.

The heteropolar inductor alternator excitation system will improve reliability and cut maintenance for large generating units, claimed J. A. Zimmerman, Allis-Chalmers. The new system substitutes selenium rectifiers and magnetic amplifiers for the commutator, brushes, and moving controls of conventional systems for marked improvement in performance, he said.

Automatic control of power flow in tie lines is essential to economy interchange, inferred Nathan Cohn, Leeds & Northrup. Proper solution to this can cut incremental power cost. Extension of automatic control to individual generators, he continued, can give further benefits in power production cost.

Distribution Planning . . . Today utilities must scrutinize anew the principles which guide additions to distribution plant, said L. M. Olmsted, Electrical World. Engineering must provide reliable and economical service. Olmsted reviewed EW's survey of distribution trends (EW May 17, 1954, p 133, Aug 23, 1954 p 103) to show changes already anticipated. Obsolescence of meters, service drops, and small transformers is a new problem for the future, he warned.

The philosophy of planning distribution for load growth was explored by D. K. Blake, General Electric. Engineers must understand how economic design changes with load density and the effect on unit sizes, voltages, and system patterns. For 2000 A.D. he visualized 16 times today's load density with 100-kva transformers 175 ft apart served by 10,000-kva, 4-kv substations.

Problem for the future is enough sites for these substations, said Blake. Changing to 12 kv eases site selection but economical methods must be found for converting existing systems. He suggested that urban areas remain unchanged as the advantage of 12 kv is greater at light densities.

Boosting service to 240/480 has obvious advantage to utilities, Blake continued. But engineers must recognize that customers spending $7 billion a year for appliances cannot be expected to pay extra for the new service voltage.

Supervision Speeds Restoration . . . Supervision at a higher level than foreman is essential if maximum efficiency and speed of service restoration are to be attained under an emergency aid program, said R. W. Leach, Wisconsin Electric Power Co. He said that men from their general engineering department were called upon for supervision during the severe storm that struck Kenosha, Wisconsin, last July.

Trees and lines can live together, said E. H. Scanlon, consulting arborist of the Cleveland Electric Illuminating Co. He advocated careful selection of trees to fit space and conditions,

(*Continued on page* 25)

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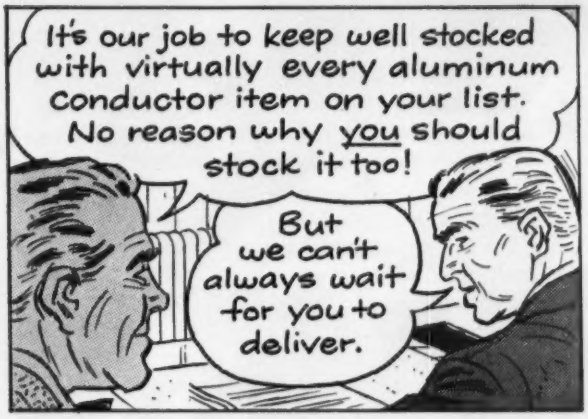
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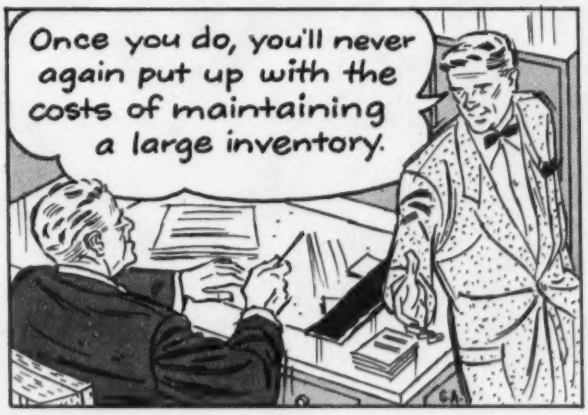

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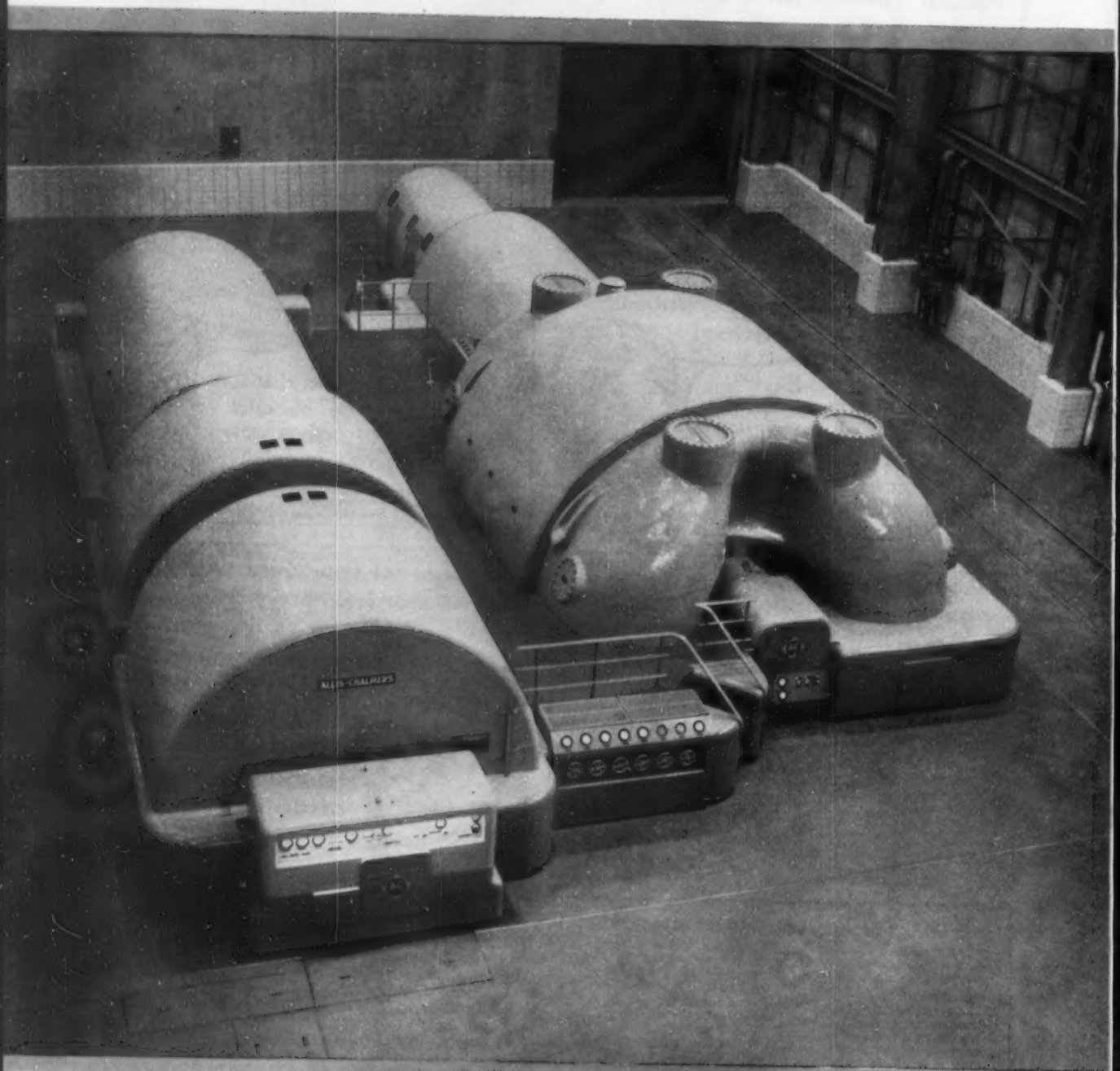
Interstate Electric Co. of Shreveport, Inc.
Lighting Fixture and Electric Supply
Mack Electric Supply Co.
Maydwell & Hartzell, Inc.
Monroe Hardware Co.
Nelson Electric Supply Co.
Ozark Electric Supply Co.
Russell Belden Electric Co.
S. M. Supply Co., Inc.
Southern Minnesota Supply Co.
Stuart C. Irby Co.
Stubbs Electric Co.
Vermont Hardware Co., Inc.
Virginian Electric, Inc.
Waltrip Electric Co.
Wells Electric Supply Co., Inc.

GET IN TOUCH with your nearest Kaiser Aluminum Distributor *now*. He makes available long experience, specialized knowledge, and valuable engineering services—including the famed field and engineering services of Kaiser Aluminum. For his name, refer to the list at the left and your local telephone directory. Kaiser Aluminum & Chemical Sales, Inc. *General Sales Office*, Palmolive Bldg., Chicago 11, Ill.; *Executive Office*, Kaiser Bldg., Oakland 12, California.

Kaiser Aluminum

The Nation's Largest Supplier of Aluminum Triplex and Weatherproof Conductor

NEW Milestone in



50 YEARS TURBINE

ALLIS-

Steam Turbines

World's first close-coupled, cross-compound reheat turbine completes first year of operation, sets pattern for future power generation.

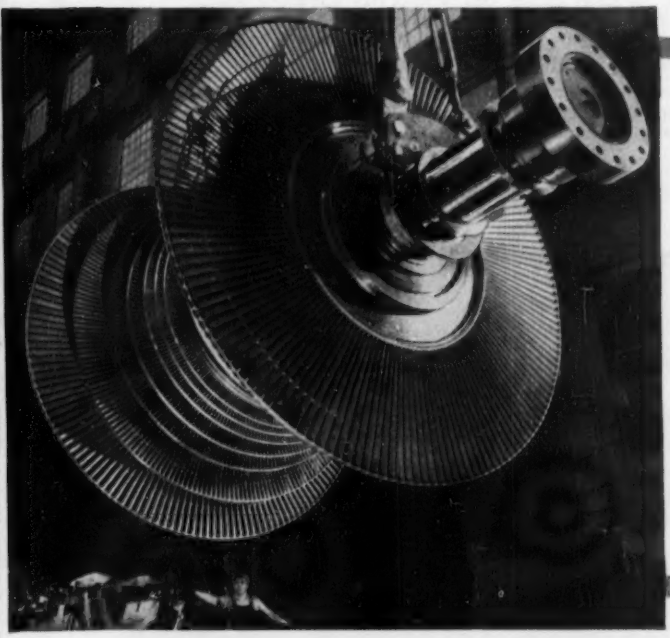
WISCONSIN ELECTRIC POWER COMPANY'S first unit at its new Oak Creek Station has proven design features that open new possibilities for steam turbine development. One additional Allis-Chalmers unit of the same type is being installed, another is under construction.

Close-coupled design makes a compact unit possible. It can be installed transversely or longitudinally in the turbine room with minimum crane span and still stay within space limitations of the boiler. End result is a smaller building with smaller turbine foundation. The entire unit rests on a single foundation. With the shafts so close together, oil piping can be reduced to a single feed and single drain line for both high and low speed machines. Steam piping is short and direct. A short "cross-under" carries steam from the intermediate pressure turbine to the center of the double-flow, low pressure 1800-rpm turbine.

Both high and intermediate pressure turbines operate at 3600 rpm, keeping the high temperature turbines favorably small in physical size. Primary steam to the high pressure turbine is at 1000 F, and reheat steam to the intermediate pressure turbine is also at 1000 F. The 120,000-kw unit generates two-thirds power at 3600 rpm and one-third at 1800 rpm.

You can depend on Allis-Chalmers for pace-setting turbine-generator units engineered to meet your requirements... in ratings up to 500,000 kw. For information, contact your nearby A-C representative or write Allis-Chalmers, Milwaukee 1, Wis.

A-4451



Longest Exhaust Blades

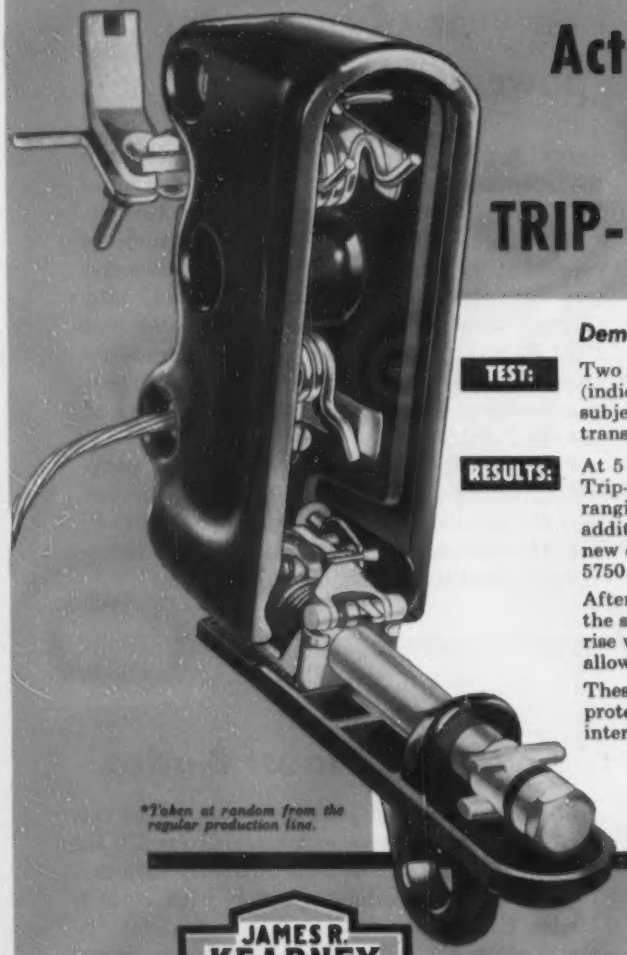
This cross-compound 3600/1800-rpm reheat turbine provides the large exhaust area needed for superior performance of high capability turbines. Its low pressure turbine operates with 40-inch blades, longer than any previously used. It operates at unusually low ½-inch exhaust pressure. The same low pressure turbine could be used at 1-inch exhaust pressure on a 250-mw unit. In addition, units of this type can be built in sizes up to 500 mw.

CHALMERS

A-C ALLIS-CHALMERS

more Proof!

QUALITY CUTOUTS PAY OFF IN LOWER MAINTENANCE



*Taken at random from the regular production line.

Actual Field Tests of KEARNEY H-D TRIP-O-MATIC CUTOUTS

Demonstrate High Short Circuit Interrupting Capacity

TEST: Two standard, 100 ampere, 5 KV TRIP-O-MATICS* (indicating 12143-20 and non-indicating 12143-21) were subjected to faults on the 5 KV side of a 10,000 KVA transformer.

RESULTS: At 5 KV with a power factor of 20%, the Heavy Duty Trip-O-Matic Cutout successfully interrupted nine shots, ranging from 5500 to 6350 amperes, RMS. Three additional tests were made on the same box with a new door installed, successfully interrupting 5800, 5750 and 6050 amperes.

After the short circuit test, a heat run was made on the same non-indicating box. Maximum temperature rise was found to be 21°C, as compared to the 30°C allowed by NEMA on new cutouts.

These test results are proof-positive that Kearney cutouts protect your circuits with *even greater* short circuit interrupting capacity than their nameplate ratings.

NOTE: These reports are NOT BASED ON CALCULATION! They are the results of actual field tests at Kearney's 34.5 KV substation. Power was taken from the Union Electric circuit providing a 445,000 KVA backup.

JAMES R. KEARNEY CORPORATION ST. LOUIS, MO. GUELPH, ONT.

The Mark of Quality Products

JAMES R. KEARNEY CORPORATION
4224-42 Clayton Ave.* St. Louis 10, Missouri
Canadian Plant: Guelph, Ontario

Cheaper cutouts than Kearney can be made — but none that save you more in the long run. There's just no substitute for quality in protection of distribution circuits — and profits. The engineering skill, top-quality materials, and extra-long life built into all Kearney products pay off endlessly in more economical and safer maintenance. Specify Kearney for lasting satisfaction that saves and saves and saves! Ask your Kearney Representative or write for catalog information today.

Specify **KEARNEY Products**

For Better Construction . . . For Safer Maintenance

137

Wisconsin Utilities

(*Continued from page* 20)

and showed pictures to illustrate right and wrong methods.

Participation in civil defense by crews of Wisconsin Public Service Corp was reported by G. G. Ellerbrook. Mobile radio is used to send aircraft warnings to their dispatcher who relays reports to the civilian defense center.

Unanimous endorsement of ownership and control of utility radio systems by their users was presented in a committee report. Among reasons cited were: continuing availability of channels, better service at competitive cost.

Early experience with microwave does not represent equipment available today, said Nelson Tharp, Westinghouse Electric Co. A system properly designed, installed, and maintained will be highly reliable and compare favorable with other communication means, he continued.

Shipment of University of Wisconsin's ac network calculator is expected in May 1955, said Prof H. A. Peterson. The board should be ready for service by September.

Sales and Service . . . Formally organized sales training schools, open to high school and college graduates as a adjunct to their curriculum, were recommended by R. C. Daly, General Electric. He also proposed that utility men serve on their staffs.

"Get behind the Beauty Plus lamp promotion," urged D. E. Bootes, Dayton Power & Light. He said, "This is our program," promoted and developed by EEI, supported by the manufacturers, and backed by the utilities.

All segments of the industry—dealers, distributors, and utility sales forces—are stimulated to maximum efforts by promotions and incentives, said W. S. Bascom, Union Electric Co. He described many activities of Union Electric's Trade Cooperation Division.

Every utility should have a plan for financing wiring costs because the cumulative effect of all working together will get something done, declared F. F. McCoy, Wisconsin Electric Power. McCoy described the plan his company has used since April for major appliances, opened up Sept 1 to include all residential wiring.

C. F. Lageman, Wisconsin Public Service, reported they have already surveyed 60% of their customers to find what appliances they have. Each salesman spends part of his time on the survey. Information is checked on punch cards and tabulated by business machines.

Activities reported by committees included:

1. A program to interest home economics graduates in working with utilities. This included a book with story and pictures of home economist's work, to be presented to each of the state's colleges awarding a degree in home economics.

2. Plans for work with the Governor's Committee on Highway Safety to bring lighting into the picture.

3. Recommendation that appliance promotion be coordinated with national promotions.

4. Recommendation that companies facilitate making wiring adequate by adopting a wire-on-time program.

New Officers . . . Martin E. Juhl, vice president, Lake Superior District Power Co, was elected chairman of the Technical Division, Electric Section. Frederick D. Mackie, superintendent of distribution, Madison Gas & Electric Co, became vice chairman.

M. R. Norton, general sales manager, Wisconsin Power & Light Co, was advanced to chairman of the Electric Division Sales and Service Section. And Almer Skretting, general sales manager, Wisconsin Electric Power Co, was elected vice chairman.

Gas Turbine Fuel Problems . . .

. . . are discussed at meeting of EEI Prime Movers Committee. Oil must be inhibited in order to end slag deposits and corrosion

Because residual fuel ash is corrosive to high temperature parts of gas turbines and also tends to form slag deposits, it has been necessary to develop methods of inhibiting and processing the fuel. This information was disclosed this month in Edison Electric Institute news release on the meeting of its Prime Movers Committee. It was held at Albany, N. Y., in October.

The committee heard that a procedure of water washing and centrifuging combined with the use of an economical additive of magnesium sulphate has been tested. Three million gallons of this treated fuel has been burned. As a result of the tests and operating experiences, a fuel specification has been prepared that defines residual fuels for gas turbines.

A report summarizing operating data on nine gas turbines using oil as fuel was also presented. The machines included in this report have generated an aggregate of 92 million kwhr using No. 2 or No. 6 fuel oil. No major difficulties have been experienced.

Corrosion . . . A report of turbine valve screen corrosion and plugging with iron oxides was submitted. In some of the reported cases the loss in weight of these screens was 25% of the original. In other cases complete disintegration occurred. It was also disclosed at the meeting that more companies are using morpholine than ammonia or cyclohexylamine for pH control in an effort to alleviate corrosion. Six times as many companies use sodium sulphate as use hydrazine for scavenging of oxygen.

Synthetic Lubricants . . . The committee heard that the continued hazards of fire have intensified the search for non-inflammable lubricating oils. Although some synthetic lubricants are available, none of them is considered suitable for turbine service.

Chlorine service systems can constitute a safety hazard if proper handling and emergency facilities are not provided. Details of chlorine handling provisions were described. It was also said that employees should be thoroughly instructed in the use of gas masks and that this equipment should be located adjacent to but not in the chlorine area.

The committee-sponsored research project into the fundamentals of the formation of iron oxide, its carry-over, and deposition in modern steam plant cycles was discussed.

The regular committee meeting was supplemented by a symposium on reactor design.

No utility has ever "bought" a Watthour Meter

You see, to our way of thinking, a utility does not "buy" watthour meters—it invests in them. Watthour meters are the instruments through which an electric power company's revenue is determined. Don't you agree that purchasing them is really an investment . . . an outlay of capital with the view of obtaining an income or profit?

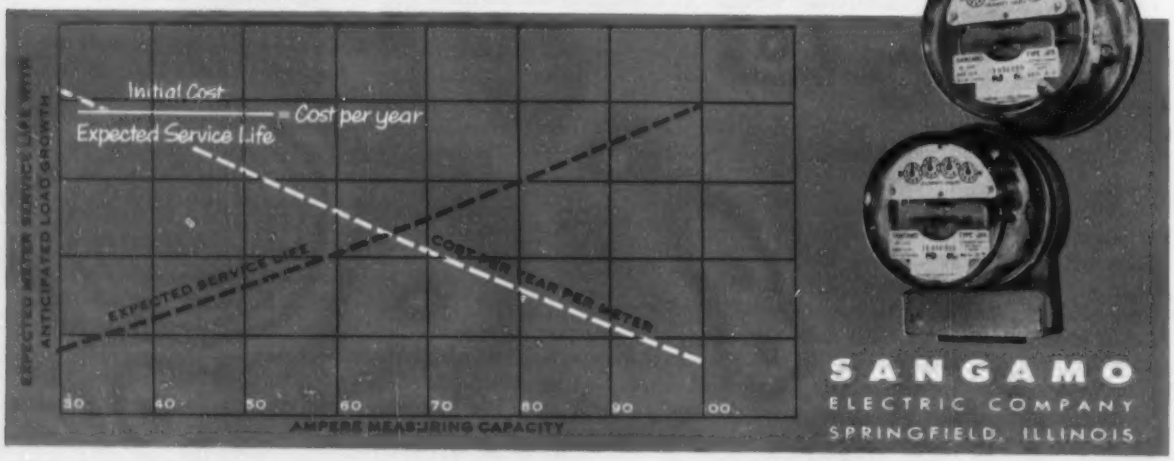
Over two hundred utilities with more than 25,000 customers on their lines have *invested* in nearly ¾ million J2 Meters since last March.

And their investments are protected because the J2 was designed specifically *to meet any future load growth.* If you divide the many years of service you can expect from a J2 Meter into its initial cost, the J2's cost per year is very low.

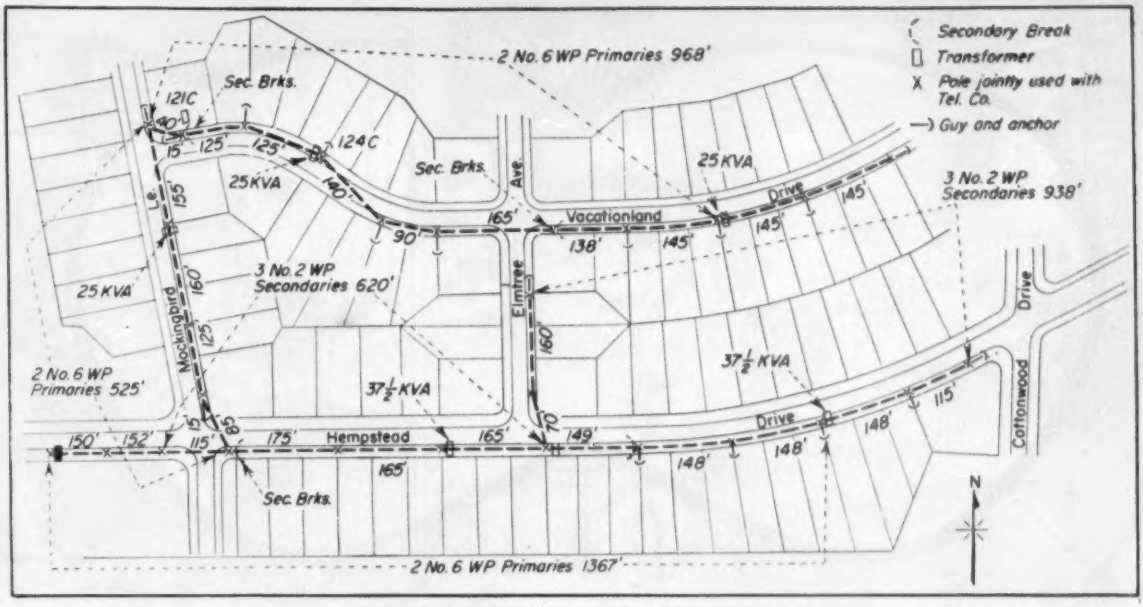
So when it comes to meters, choose the Sangamo J2 Watthour Meter, the first and finest 15 ampere meter with 100 ampere capacity . . . the meter that protects your investment in metering and lowers investment costs.

the FIRST watthour meter with straight line accuracy up to 100 amperes!

JM54-11



SANGAMO
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS



DISTRIBUTION INSTALLED consisted of a single-phase secondary design with 300 ft of three No. 2 radial secondary mains each way from 25-kva transformers. Twenty of ninety homes have central air conditioning units with 3 and 5-hp motors. Flicker has been avoided

Serving Air Conditioning Cheaply

H. W. GRATE, Superintendent of Engineering & Planning, Cincinnati Gas & Electric Co, Distribution Engineering Department, Cincinnati, Ohio

When Cincinnati Gas & Electric Co was approached by a realtor in 1952 for service to a new development where at least half of the 90 homes would be equipped with central air conditioning, studies were made to determine the most economical method of serving the load. The air conditioning units were to be equipped with 3-hp and 5-hp motors.

Normal single-phase secondary design for the Cincinnati system provides for three spans of three No. 2 secondary. With this design there would be a 12-v drop under starting conditions with a 5-hp motor that has a locked-rotor current of approximately 125 amp.

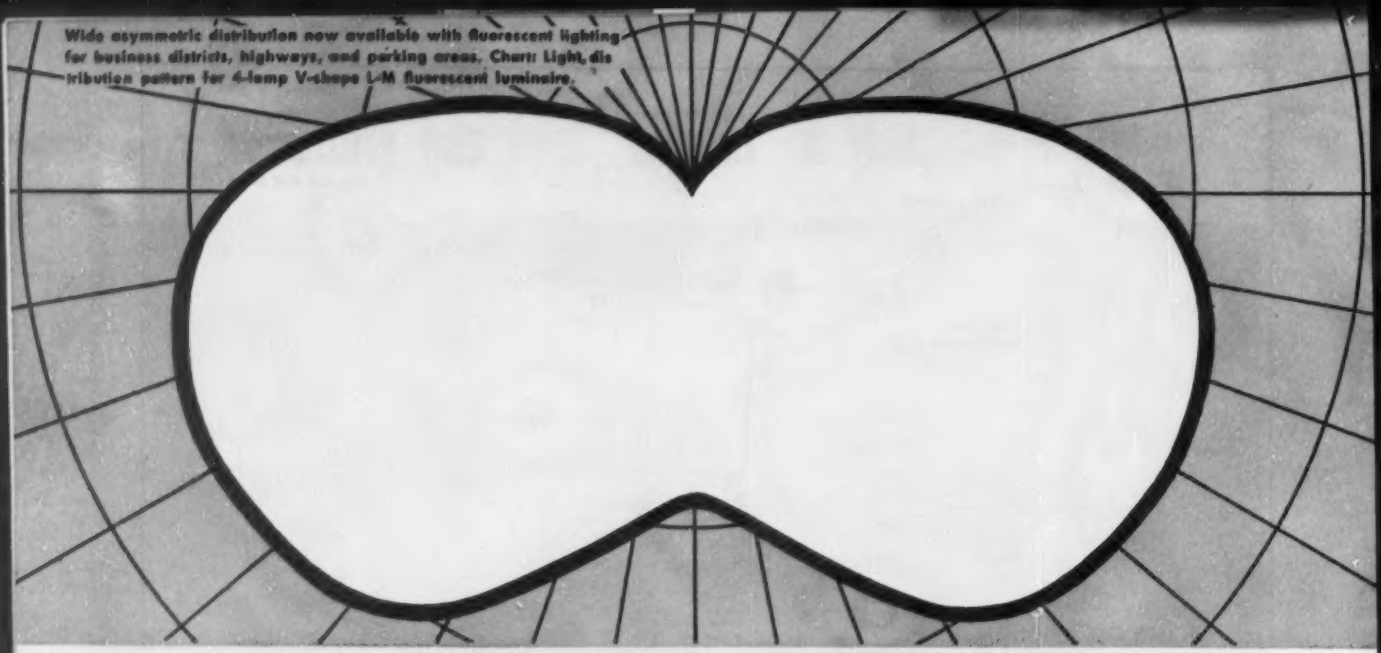
The cost of alternative service designs was studied, including 3-phase service for 5-hp motors having locked rotor current of 90 amp. Results of cost studies are shown in the accompanying table.

Plan C was chosen because it involved minimum cost. Plans were to bank the secondaries with fuses at the normal secondary breaks if flicker became objectionable.

Layout of primaries and secondaries is shown. The realtor's estimate of the number of central air conditioning installations proved optimistic. So far there have only been 20 houses equipped with central air conditioning. There have been no complaints of flicker.

Cost of Alternative Plans for Serving 90 Air Conditioned Homes

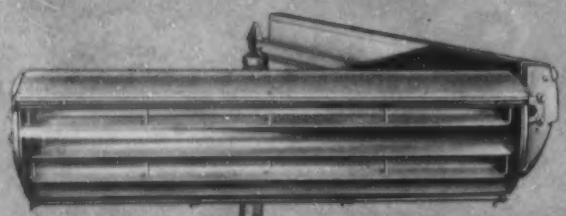
		Cost	Voltage Drop Starting	Total Cost
A.	Normal single-phase secondary design; 400 ft 3 No. 2 radial, 5—25-kva transformers	$4,563	12 volts	
B.	Three-phase, 3 No. 6 secondary; 4—25-kva transformers	5,880		$10,443
C.	Single-phase secondary design; 300 ft 3 No. 2 radial, 5—25-kva transformers		9.5 volts	4,828
D.	Single-phase secondary design; 300 ft 3 No. 2 radial, 5—25-kva CSPB transformers		4.75 volts	5,259
E.	Three-phase, four-wire secondary design; 400 ft 3 No. 2 radial, 400 ft 1 No. 6 radial, 4—25-kva single-phase transformers		7.7 volts	
	4—15-kva single-phase transformers connected open delta		7.2 volts	6,450
F.	Three-phase, four-wire secondary design; 300 ft 3 No. 2 radial; 300 ft 1 No. 6 radial, 5—25-kva transformers		5.3 volts	
	5—15-kva transformers connected open delta		4.8 volts	6,907



Wide asymmetric distribution now available with fluorescent lighting for business districts, highways, and parking areas. Chart: Light distribution pattern for 4-lamp V-shape L-M fluorescent luminaire.

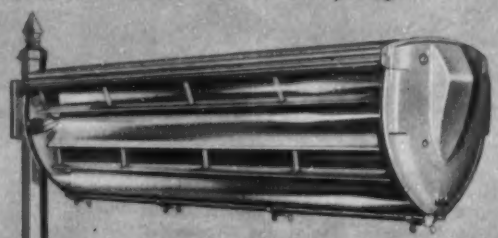
L-M Fluorescent Luminaire Installation Data

Average foot candles at 50° F. temp. in still air—25' mounting height. Illustrations below show L-M's various types of units and mountings, together with the average foot candles on the street with various spacings.



4-lamp V-shape fluorescent luminaire provides more even light distribution for wide streets.

4-Lamp V-shape Fluorescent Luminaire*		
Spacing	Staggered 50' Street Width	Opposite 70' Street Width
75 ft.	1.75 A.F.C.	—
100	1.30	2.15 A.F.C.
125	1.05	1.90
150	0.85	1.45
175	—	1.25

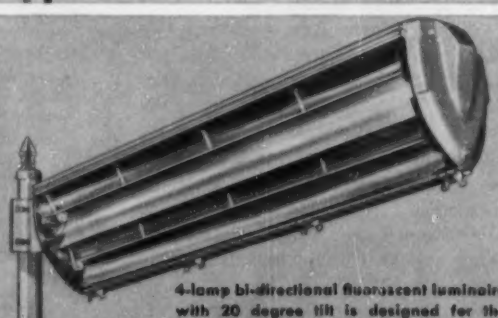


4-lamp bi-directional fluorescent luminaire provides a broader light pattern for center parkway and area lighting.

4-Lamp Horizontal-mounted Fluorescent Luminaire*			
Spacing	Center-Mounted Twin Arm 40' Road Twin Roadways	Staggered 50' Street Width	Opposite 70' Street Width
75 ft.	2.85 A.F.C.	1.35 A.F.C.	—
100	2.15	1.00	1.55 A.F.C.
125	1.70	0.80	1.26
150	1.40	0.65	1.05
175	1.20	—	0.90

2-lamp uni-directional fluorescent luminaire is available for underpasses, floodlighting, perimeter, and ramp lighting.

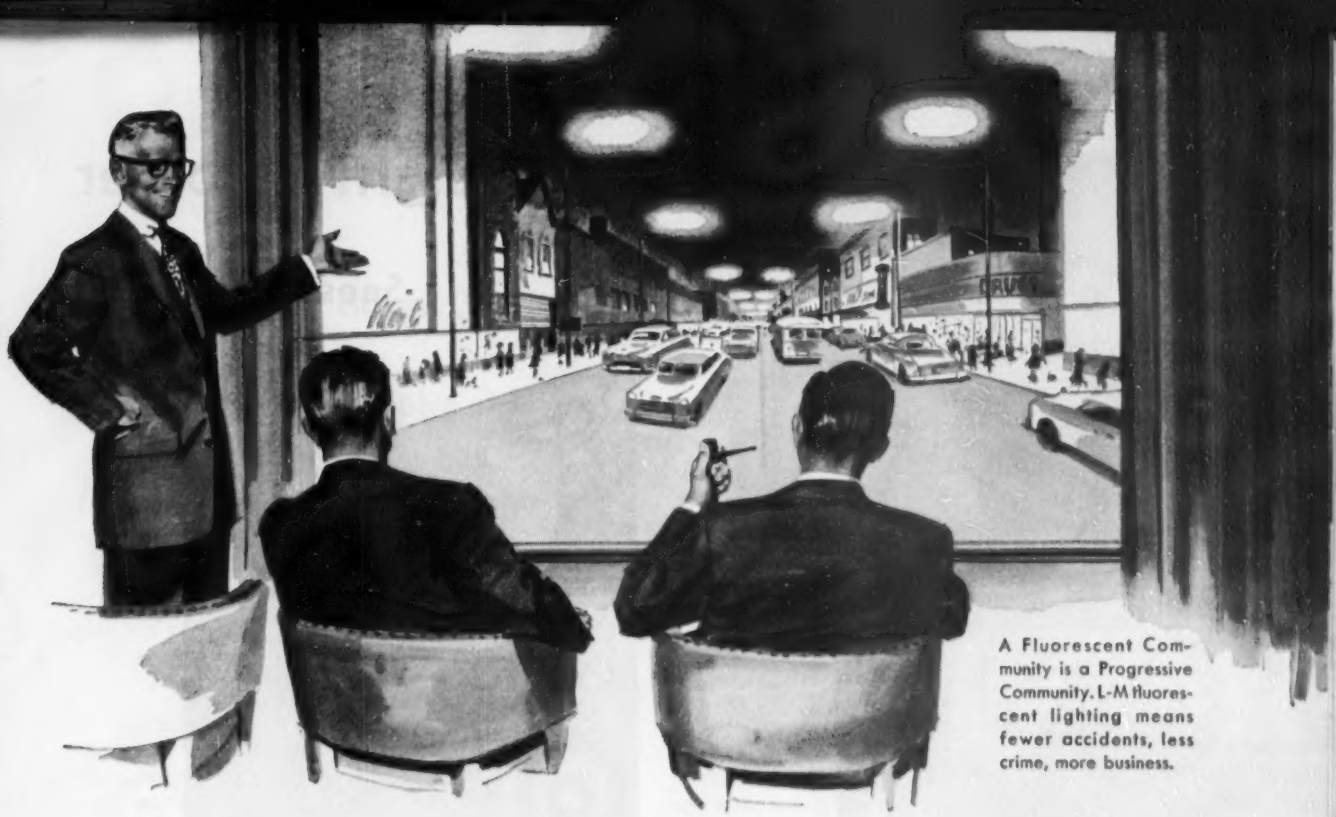
2-Lamp Uni-directional Fluorescent Luminaire*		
Readings were made of ramp installation consisting of ten 2-lamp uni-directional fluorescent luminaires. 22' mounting height—spaced 8' on center.		
Dist. From Source	Vertical F.C.	Horizontal F.C.
50 ft.	9.70	6.50
100	2.40	1.20
150	1.10	0.35
200	0.65	0.05
250	0.40	—
300	0.25	—
350	0.20	—



4-lamp bi-directional fluorescent luminaire with 20 degree tilt is designed for the narrow street and entrance way.

4-Lamp Tilted Fluorescent Luminaire (20° Tilt)*			
Spacing	Staggered 40' Street Width	Staggered 50' Street Width	Opposite 70' Street Width
75 ft.	1.50 A.F.C.	1.35 A.F.C.	—
100	1.15	1.05	1.60 A.F.C.
125	0.90	0.80	1.30
150	0.75	0.65	1.10
175	—	—	0.90

*From test reports E353-83, E353-817, E353-810, E353-88.



A Fluorescent Community is a Progressive Community. L-M fluorescent lighting means fewer accidents, less crime, more business.

L-M's New Fluorescent Street Lighting Luminaire

Large Light Source, Minimum Glare

By **STACY STANDLEY**
Manager
Lighting Sales
Line Material Company

L-M's New Fluorescent Luminaire is a revolutionary improvement in street lighting. With its large light source the fluorescent luminaire produces an even, cool white color over a large area. Because of its large light source, it provides virtually glareless illumination.

Fluorescent luminaires provide a light that is particularly advantageous in business and shopping sections. The surrounding sidewalk area adjacent to the curb is illuminated and gradually fades out to make the background contrast as gradual as possible. This provides a wider scope of vision for both the motorist and the pedestrian, in addition to creating a cheerful and active atmosphere in the shopping area.

L-M's New Fluorescent Luminaires are available in these styles:

1 4-lamp V-shape for use on wide streets

2 4-lamp bi-directional tilted 20° toward the street for narrower streets and entrance ways

3 4-lamp bi-directional with level horizontal mounting for center parkway and area lighting

4 2-lamp uni-directional for underpass, flood lighting, perimeter and ramp lighting

The fluorescent lamp used in these luminaires has a rated lamp life of 7500 hours. This longer lamp life reduces the cost of relamping luminaires below any other type now used for street lighting.

Features of L-M's New Fluorescent Luminaires

Large light source • Even, cool white color • Minimum glare • Low power consumption • Longer lamp life

Separate efficient reflecting system for each lamp • Good vertical component across the whole surface of the street • Good balance between building and road surface

Two lamp ballasts • Easy accessibility for relamping • Wiring terminal block easily accessible • Ballast can be removed very simply • Bracket adjustable ±5° for leveling.

L-M's fluorescent luminaires are easily accessible for cleaning, relamping, wiring terminal block and ballast removal. Four-lamp unit has two ballasts with one tube on either side of the luminaire paired to each ballast. Thus, if one tube burns out, the light output of the luminaire is reduced only 50% in each direction. Also, if desired, two lamps could be switched off for part night circuits.

Get Complete Information

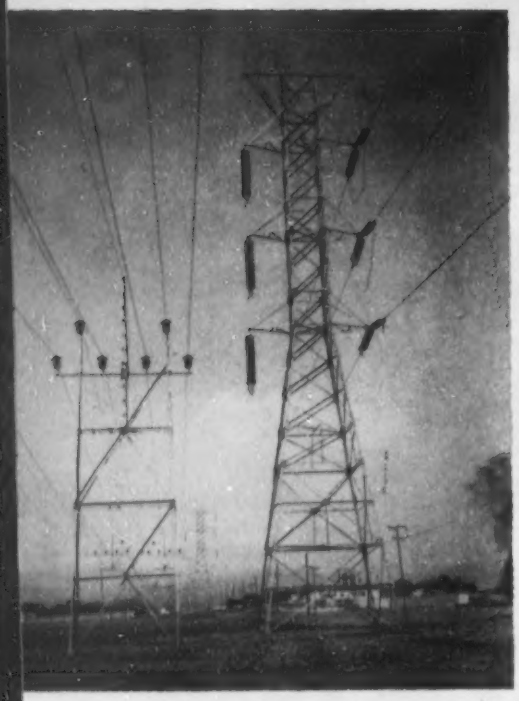
Details of the new L-M fluorescent luminaires are available. Ask the L-M Field Engineer for information, or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

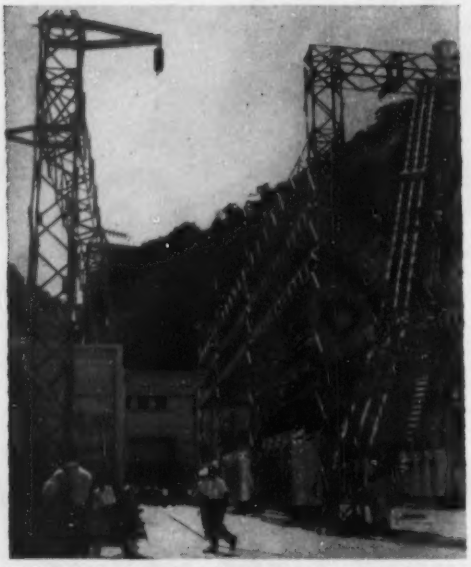
LINE MATERIAL

Street Lighting

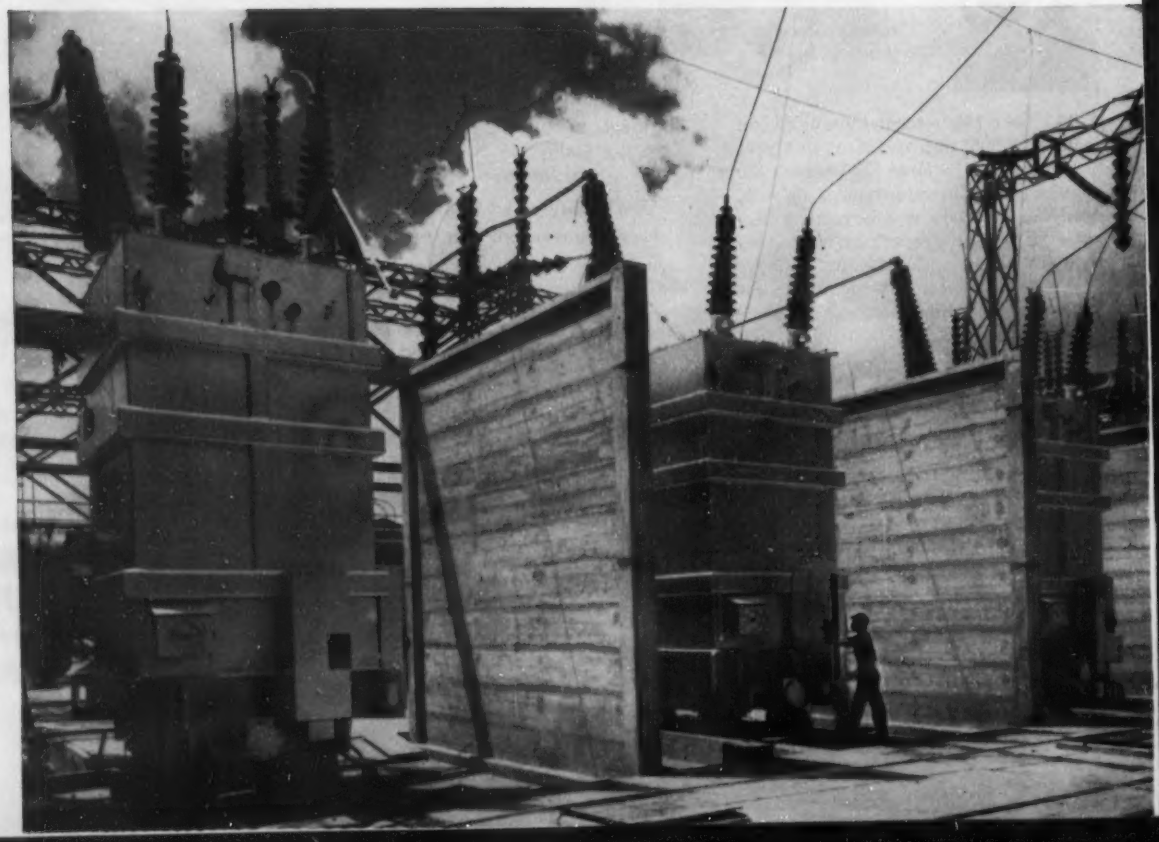
Mexican Light & Power

Sees bright future





PENSTOCKS, above, feed Mexican L&P's new Patla plant. At left, new 220-kv transmission parallels old 85-kv line. Below, transformers of new El Salto substation.



with troubleshooter Draper

aiming to make it

finest utility in Latin America

The finest utility in Latin America—that's what an American troubleshooter, Gen William H. Draper, Jr, wants to make Mexican Light & Power Co, Ltd. As chairman of Mexico's largest electric utility, he has made an auspicious beginning in that direction.

Draper bit into this hot tamale in April 1954 when he took over the chairmanship from former U. S. Ambassador to Argentina, George Messersmith. Draper had been elected to the company's board in late 1953 but had been tagged as a good candidate for the job back in 1946 by Dannie N. Heineman, 82-year-old chairman of the Belgian parent holding company, Sofina (Societe Financiere de Transports et d'Enterprises Industrielles). Draper was then economic adviser to Gen Lucius Clay in Berlin. Subsequently he was Under Secretary of the Army and a trustee of the Long Island Railroad Co.

The persuasive Messersmith, now honorary chairman, had paved the way for revitalizing the company. He talked Miguel Aleman, then Mexican president, into endorsing and guaranteeing a $26-million World Bank loan to the company. He also obtained verbal assurance the company would not be expropriated and would be given a rate increase. Then Draper took over.

Among the company's major headaches had been labor trouble. In addition to crippling strikes, the union, backed by Mexican law, had successfully prevented Mexican Light for years from establishing branch offices and introducing modern accounting equipment and procedures. Today, the union is cooperative.

Since Draper has been in office, 14 modern branch offices have been opened and equipped with modern accounting machines. Ten more are scheduled. (Not only did the company have to cope with thousands of customers trying to pay their bills at one office, but it had to bill and collect each month from thousands using only the minimum consumption, paying about 33¢ a month.)

Cementing better relations with the government has been another Draper achievement. Key officials of the Mexican Federal Commission of Electricity were echoing the union's call for nationalization of the company. This action seemed imminent. That the pendulum has swung the other way was attested to at the recent inauguration of Mexican Light's new 45,600-kw Patla hydro plant.

President Ruiz Cortines himself, together with a host of high government officials, made a day's journey to the tropics of Puebla state for the dedication. Observers south of the border look upon this event as government recognition that public utilities can, after all, operate most efficiently in private hands.

Three other events mark the coming of the dawn for Mexican Light: Installation of sufficient power to meet its needs until 1958, a 21.2% rate increase effective with last October's billings (and promise of another increase next year), and declaration of the first dividend since 1913 (25¢ a share payable Dec. 25 to stockholders of record Nov. 24).

The Patla project increases generating capacity by 45,600 kw to about 500,000 kw. And the company buys 133,000 kw from the federal electric commission. Patla consists of three vertical shaft generators coupled directly to 21,000-hp turbines. Adjuncts to the plant are the 220-kv, 3-phase transmission line and two new substations. The steel-reinforced aluminum transmission cables run about 86 miles to the outskirts of Mexico City.

Each of the new El Salto & Cerro Gordo substations is equipped with two 100,000-kva transformer banks plus a reserve transformer.

As Draper proceeds with his plans to turn Mexican Light into a sound business enterprise, he is quick to pay tribute to the founder of the company.

"Mex Light," he relates, "was founded by one of the real pioneers of the international power field—Frederick Stark Pearson." An American engineer, Pearson built the company's Necaxa dam in the early 1900's. At that time it was the largest earth-filled dam in the world. He also linked it to Mexico City with the longest transmission line in the world at that time.

Today, Mexican Light employs 7,500, and its monthly billings run to $2.5 million. Its service area is limited to greater Mexico City with a population of nearly four million, plus over half of Mexico's industry. Rates are lower than the average of the 50 largest cities in the U. S., and lower than most in Latin America.

Connecticut L&P Aids Point Four Program

Connecticut Light & Power Co is participating in the Point Four Program of the Foreign Assistance Act by furnishing a six months' electrical training to an Ethiopian high school teacher assigned to the United States for 18 months. Yilma Tadesse, head of the electrical department of a technical high school in Addis-Ababa, is shown above with CP&L Meter Engineer Daniel A. McNulty checking an instrument used to test residential electric meters.

Tadesse, who joined the utility's test department early in October, is getting supervised instruction and training in construction and operation of heavy electrical equipment. After a six-week stay at CP&L's Berlin headquarters, he now will be assigned to various CL&P districts and power plants.

'Quantum Jump' Study Set by Fairchild Engine

Fairchild Engine & Airplane Corp has completed negotiations to sponsor research on the "quantum jump" (EW July 5, p 38) theory of nuclear fission of carbon atoms.

If the revolutionary theory is proven practical, it is said it will increase by 8,000 times the usable power from coal, petroleum, and other carbonaceous fuels.

Fairchild has employed the theory's inventor, retired Army Col Harry Hardsog, former Defense Department research and development officer. He will establish a laboratory for the company at Northboro, Mass.

Theoretically, the process could release 78,300,000 Btu's from a pound of coal compared with about 10,200 Btu's at present when a pound of coal is burned. But much work remains to be done to establish the practicability of the theory and particularly, whether the process can be conveniently controlled.

Kaiser Co to Undertake $100,000 A-Power Study

Henry J. Kaiser Co engineers are undertaking a $100,000 evaluation study of the technical and economic phases of atomic energy, with emphasis on nuclear power.

This is the 18th such study contract signed by the Atomic Energy Commission. It is expected to produce a report, in one year, including a survey of progress in the nuclear reactor field to date, a determination of the feasibility of an industrial power reactor which might be built in the next few years, the isolation of the remaining research and development needed prior to construction, and recommendations on overall development and power applications.

Kaiser is a comparative newcomer to the atomic energy business. It set up an atomic energy division in June, 1953, and last fall it contracted for $138 million of construction at Hanford, Wash. That task is just about completed.

Kaiser's Atomic Energy Division is a part of Kaiser Engineers Division, which has had wide experience in construction of steam and hydro power projects.

Conservationists Shift Stand on 'Upper Colorado'

Conservationists meeting in New York recently revealed that they would withdraw their opposition to the Upper Colorado River development program provided Echo Park Dam is dropped from the project.

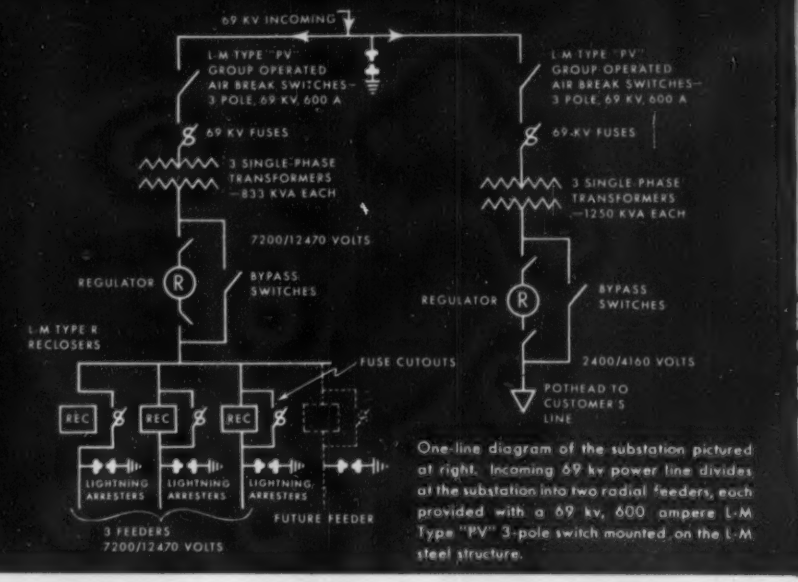
The group timed its day-long conference to serve as a warning to members of Congress that opposition would be continued if Echo Park Dam were included in any new bill authorizing the $1-billion Upper Colorado project. The conservationists maintain construction of the dam would flood a good part of Dinosaur National Monument in Utah.

In outlining the situation, Sigurd F. Olson, president, National Park Association, and Fred Smith, director, Council of Conservationists, took this position: Sites for a dam other than Echo Park would serve as well without hurting the park area.

At the meeting were representatives from National Parks Association, Wildlife Management Institute, National Audubon Society, Sierra Club, American Nature Association, and other organizations.

PUD Conducting Tests

Seismograph tests are being conducted by Chelan County PUD on a proposed hydroelectric damsite on Wenatchee River near Leavenworth, Wash., for a proposed 145,000-kw project. Similar tests will be made at the Rocky Reach site on the Columbia River north of Wenatchee, where a larger development is proposed. Federal Power Commission has granted a preliminary permit for the Wenatchee project.


69 KV INCOMING
L-M TYPE "PV" GROUP OPERATED AIR BREAK SWITCHES—3 POLE, 69 KV, 600 A
69 KV FUSES
3 SINGLE-PHASE TRANSFORMERS —833 KVA EACH
7200/12470 VOLTS
REGULATOR
BYPASS SWITCHES
L-M TYPE R RECLOSERS
FUSE CUTOUTS
REC
LIGHTNING ARRESTERS
3 FEEDERS 7200/12470 VOLTS
FUTURE FEEDER
L-M TYPE "PV" GROUP OPERATED AIR BREAK SWITCHES—3 POLE, 69 KV, 600 A
69-KV FUSES
3 SINGLE-PHASE TRANSFORMERS —1250 KVA EACH
2400/4160 VOLTS
POTHEAD TO CUSTOMER'S LINE

One-line diagram of the substation pictured at right. Incoming 69 kv power line divides at the substation into two radial feeders, each provided with a 69 kv, 600 ampere L-M Type "PV" 3-pole switch mounted on the L-M steel structure.

Two 3-pole Type "PV" switches being installed at a substation in the Middle West, along with other L-M equipment and apparatus. L-M also supplied the fabricated structural steel, which simplified construction of the station.

Powerful Lever Advantage Assures Positive Operation of L-M's "PV" Air Break Switches

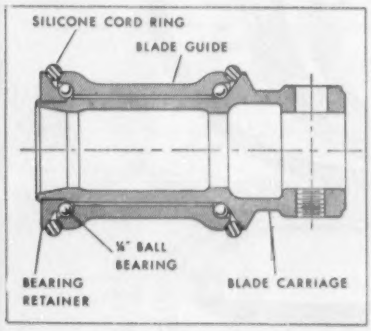
New rotating switch blade concept in switch design provides powerful lever advantage, assures positive operation to open or closed switch position regardless of ice, corrosion, or long periods of non-operation.

The primary function of the air break switch is to provide a means of connecting or disconnecting transmission and distribution circuits. In addition it must meet all of the other requirements for a good switch—ease of operation, convenience and simplicity of installation, high current-carrying capacity, high contact pressure without undue wear.

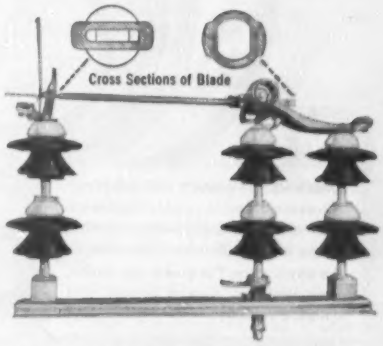
We have amply met these requirements in our Type "PV" Rotating Insulator, Vertical Break, Air Switch. Some of the outstanding features are: silver-to-silver high-pressure contacts; new contact design, with contact pressure easily adjusted in the field; ball bearings lubricated for life with silicone grease and sealed with silicone cord rings; only 6 current interchange points in the entire switch; flexible interphase mechanism assembly, permitting angular distortion of mounting structures.

These switches are for both pole and structure mounting in horizontal, vertical, or inverted position. The interphase assembly, connected direct or indirect, transmits power to the switch mechanism with minimum of lost motion. Every joint of the interphase assembly is lubricated with silicone grease and sealed with a silicone cord ring. Ratings are from 7.5 through 69 kv in 400 and 600 amperes continuous current-carrying capacity. Available with or without horn gaps, from one- to six-pole units.

For complete information on L-M Type "PV" Switches ask the Field Engineer for a copy of Bulletin PSE1 and PSE2, or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).



Smooth, Easy Operation—The method of sealing a bearing or a joint is shown in sketch above. All the bearing locations or joint locations involved in movement and transmission of power from the operating mechanism to the switch blade itself are protected from corrosion with silicone lubricant sealed in by silicone cord rings.



L-M's new 69 kv Type "PV" switch, above, has major castings of high-grade aluminum bronze alloy, which makes them exceptionally strong, permits lighter cross sections, and is virtually free from corrosion.

New Switch Design Assures Positive Operation

Drawings show blade rotation and rise between the jaw contacts.

1. Normal closed position—blade between contacts and locked in position by the action of the link and crank assembly.

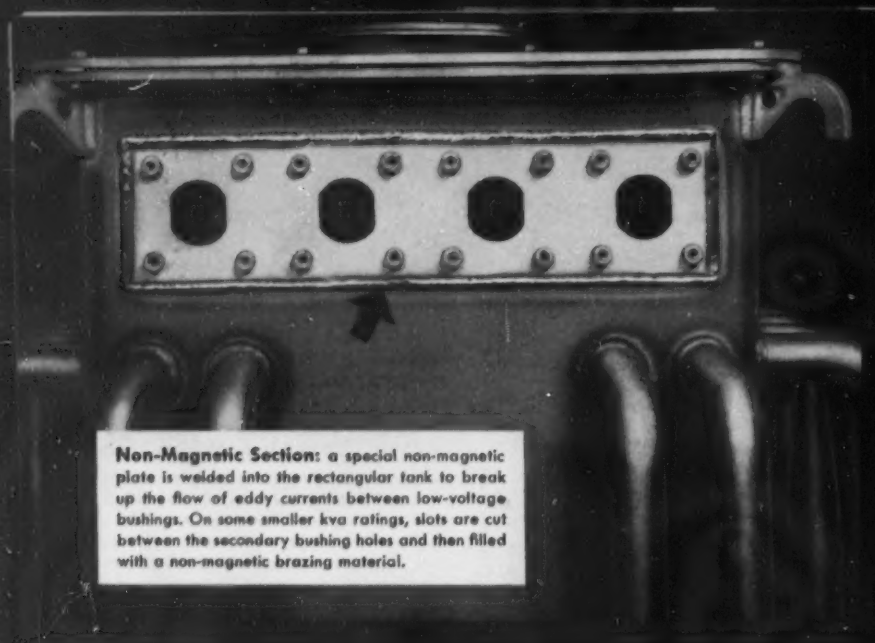
2. Start of opening motion. The blade twists 26 degrees before rising, with all the force applied at the operating handle being imparted to this twisting action, thus assuring positive breaking of any ice or corrosion.

3. The blade is now starting to rise. It has rotated 40 degrees with only a 3 degree rise. Also note how blade rotation has moved the silver inserts away from the silver inserts in the contact shoes, minimizing wear.

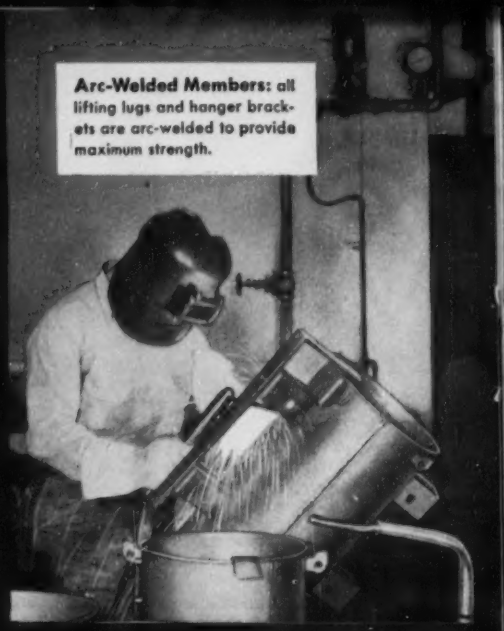
4. With approximately 37 degrees crank rotation, the blade has been rotated a full 48 degrees, but has risen only 6 degrees.

5. Blade has risen 9 degrees with a 56 degree blade rotation. On closing the switch, the reverse motion provides the most effective possible ice-breaking action if the switch should be iced open.

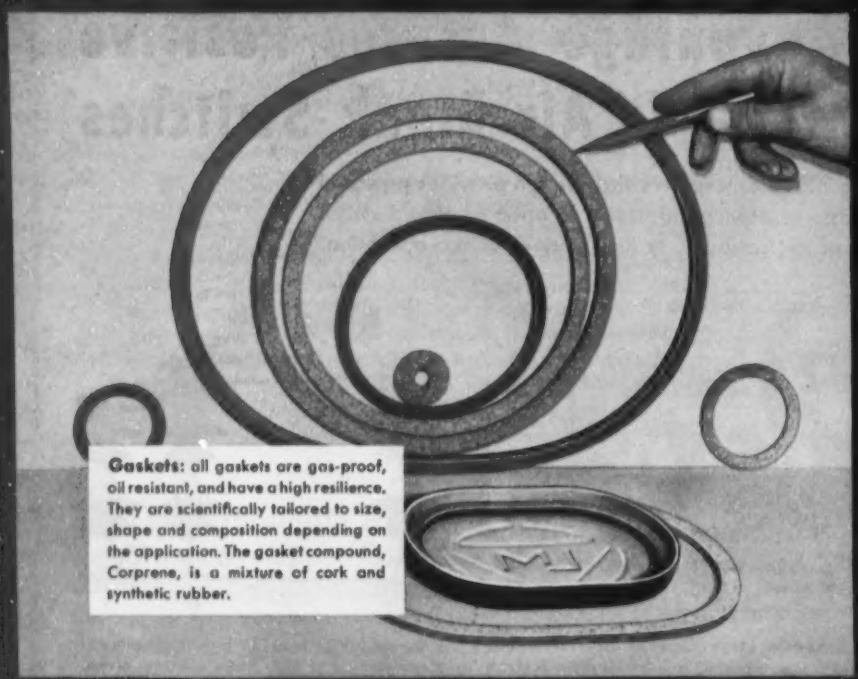
LM LINE MATERIAL Power Switching Equipment



Non-Magnetic Section: a special non-magnetic plate is welded into the rectangular tank to break up the flow of eddy currents between low-voltage bushings. On some smaller kva ratings, slots are cut between the secondary bushing holes and then filled with a non-magnetic brazing material.



Arc-Welded Members: all lifting lugs and hanger brackets are arc-welded to provide maximum strength.

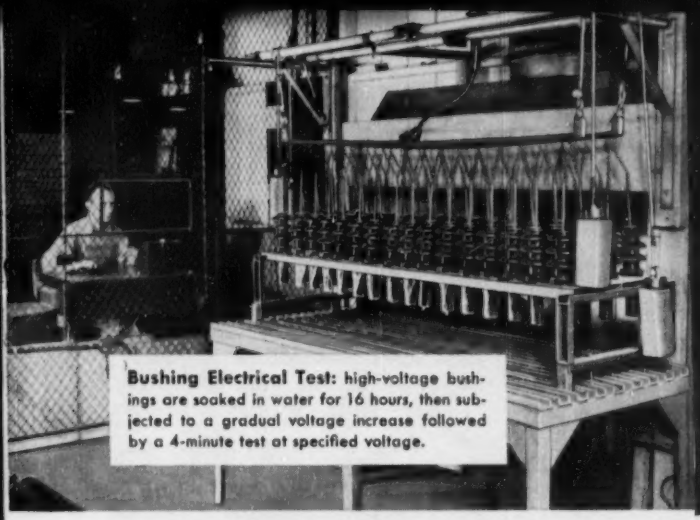


Gaskets: all gaskets are gas-proof, oil resistant, and have a high resilience. They are scientifically tailored to size, shape and composition depending on the application. The gasket compound, Corprene, is a mixture of cork and synthetic rubber.

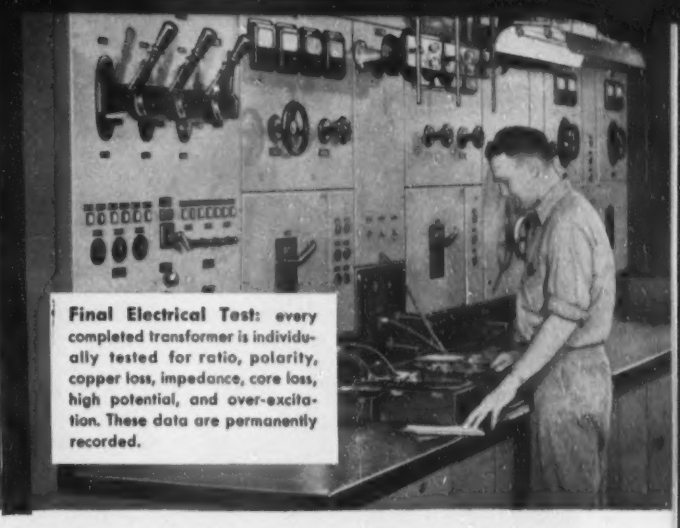
Caulking Hanger Brackets: the crevices on the inside corners are filled with an alkyd-base caulking compound to keep rust and corrosion from attacking the tank metal behind the bracket.

Stainless Steel Bolts: the cover bushings are all secured with stainless steel, rust-proof bolts. You can easily remove or replace the bushings at any time.

Special Lock Screw: the tap changer has a special lock screw with nylon insert which is completely unaffected by vibration.



Bushing Electrical Test: high-voltage bushings are soaked in water for 16 hours, then subjected to a gradual voltage increase followed by a 4-minute test at specified voltage.



Final Electrical Test: every completed transformer is individually tested for ratio, polarity, copper loss, impedance, core loss, high potential, and over-excitation. These data are permanently recorded.

L-M's Round-Wound® Transformers Have

"The Little Things That Count"

By J. G. EVERHART
Chief Engineer
Transformer Division
Line Material Company

L-M Round-Wound transformers offer outstanding performance characteristics which are largely the result of the unique wound core and round coils wound directly onto the core.

In addition to this design advantage, L-M exercises particular care in the many "little things that count."

L-M engineers and production personnel are specialists in distribution transformers. Thus, any problem in the design, manufacture, or application of distribution transformers, regardless of how minor it may seem, merits their consideration and specialized knowledge.

Experience has shown that this attention to the details in design, assembly, inspection, and testing adds appreciably to the service life of the Round-Wound transformer, to its exceptionally low failure rate, and to its over-all performance characteristics.

Get The Whole Story On Round-Wound Transformers

A 16mm. color-sound motion picture film is available for showing to members of your organization, illustrating the construction of L-M Round-Wound transformers and the care taken in "the little things that count." Ask the L-M Field Engineer for complete information, or write Line Material Company, Transformer Division, Zanesville, Ohio (a McGraw Electric Company Division).

Some of the Little Things That Count for the User

COIL:

Each coil is tagged, identifying rating, winder, wire manufacturer . . . assures control for better quality.

Extra low voltage ties . . . give added axial short circuit strength.

Varnish dip . . . provides excellent mechanical strength under short circuit.

Vacuum oil impregnation . . . assures corona-free operation and uniformly high dielectric strength.

TANK:

Everdur cover bolts (large rectangular tank units) . . . eliminate rusting, provide high mechanical strength.

Stainless steel mounting bolts—cover bushings . . . facilitate bushing removal or replacement; no rusting.

Self-locking anchor nuts . . . secure the core and coil assembly against vibration or other accidental loosening.

Scientifically selected Corprene (TM) gaskets... combine gas proofness and oil resistance with proper resilience for quality seal.

Arc-welded lifting lugs and hanger brackets . . . assure positive and permanent strength of load-carrying parts.

Caulked hanger brackets . . . prevent exposed-crevice corrosion.

Non-magnetic slots and plates in tank wall . . . reduce eddy current losses.

Petroleum jelly on secondary spades . . . prevents corrosion.

SMALL TAP CHANGER:

Fiber glass reinforced alkyd resin body . . . lengthens vertical creepage paths from line to ground.

No live parts on top of tap changer . . . increases safety.

Self-aligning line lead knob for hand tightening . . . provides maximum torque with minimum effort. Impossible to cross thread. No tools necessary.

EXTERNALLY OPERATED TAP CHANGER:

"Lifetime" Teflon (TM) shaft seal. Non-corrosive external parts. Positive positioning locking device. Self-aligning, self-wiping contacts. Stainless steel shaft.

All these features eliminate corrosion, prevent binding, assure positive, low-resistance connections, and help provide a long-lasting, smooth-operating mechanism.

TESTING:

Steel and wire acceptance tests and controls. 100% primary bushing electrical test. 100% preliminary core loss test. 100% preliminary coil ratio and polarity test. Core and coil assembly test. Leads and connections mechanically and electrically tested. Casing inspection. Power factor test.

These are examples of in-process quality control leading to over-all quality of a uniformly high level.

Final electrical line test. 100% testing for ratio, polarity, copper loss, impedance, core loss, high potential and over-excitation. Thorough testing of completed unit before shipment is final step in control for better quality.

Test records and data kept permanently on file . . . make complete design and test information always available.

Oil leak test . . . assures oil-tight welds and positive seals and gasketing.

GENERAL:

Terminals tin coated . . . gives low resistance; minimizes galvanic action when aluminum wire is used.

Swaged connections . . . have low resistance; are mechanically secure.

Inspection tags . . . assure complete checking at 4 prime stations coded for identification.

Oil-impregnated, kiln-dried, maple coil support blocks . . . assure high mechanical strength with no possibility of subsequent loosening.

Temporary plastic covers (small units) . . . prevent contamination during fabrication.

ORTO-inhibited oil . . . prevents sludging, increases life expectancy of oil.

LM® **LINE MATERIAL** *Transformers*

Giles Elected a Vice President

Pennsylvania Power Co advances former operations supervisor to executive position. He is a 30-year utility veteran

MERRITT A. GILES

Merritt A. Giles, general supervisor of operations for Pennsylvania Power Co, has been elected a vice president of the company. Giles, who assumed the supervisory position in 1951, went to Pennsylvania Power from Ohio Edison Co, where he was division superintendent of electric transmission and distribution.

Giles, a native of Peoria, Ill., is a 30-year veteran in the utility industry. He received his engineering education from the University of Wisconsin, where he was an instructor for a year following graduation. In 1923 he went to Washington, D. C., as an examiner in the U. S. Patent Office. While there he studied law at George Washington University.

Entered Utility Field in '20's . . . In 1924 he joined the Public Service Co of Colorado and a year later went with the Ohio Public Service Co, an affiliated company. He served that utility in various capacities in several Ohio communities, becoming in 1945 superintendent of the central engineering department at Elyria. He filled that position until his transfer to Akron upon the merging of Ohio Public Service Co into the Ohio Edison Co in 1950.

Square D Realigns Sales Executives

Square D Co's Sales Division has reorganized its sales, advertising and promotion departments and realigned the functions of key executives.

The company has announced that Mitchell P. Kartalia, manager of merchandise sales, has been appointed manager of distribution equipment sales and will now devote full time to its expanding markets in this field.

William H. Younger, manager of advertising, has been made manager of merchandise sales and advertising for both industrial control and distribution equipment. He will also function as chairman of the distributor policy committee, a key group formed recently to integrate merchandising policies of Square D's various operating units.

Edwin N. Cobb, operating manager of Square D's field sales office in Birmingham, Ala., since 1948, has been appointed equipment specialist. He will assist Kartalia in liaison with distribution equipment markets and handle special assignments in selected sales area. Also reporting to Kartalia will be Robert E. King, who will continue to supervise the Detroit headquarters sales department.

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John C. Kaufmann has been made a product manager for Thomas & Betts Co to supervise sales and applications of cast solderless mechanical and compression connectors for industrial uses. The new product manager joined the Thomas & Betts firm in 1951 as a sales representative.

G. Allen Lovell has been appointed assistant general manager of the Mechanical Goods Division of United States Rubber Co. Lovell, who will make his headquarters in New York, replaces **Herbert G. Kieswetter,** who has been named executive assistant to the general manager of the company's International Division. Lovell formerly was sales manager of manufacturers' products for the company's Footwear and General Products Division.

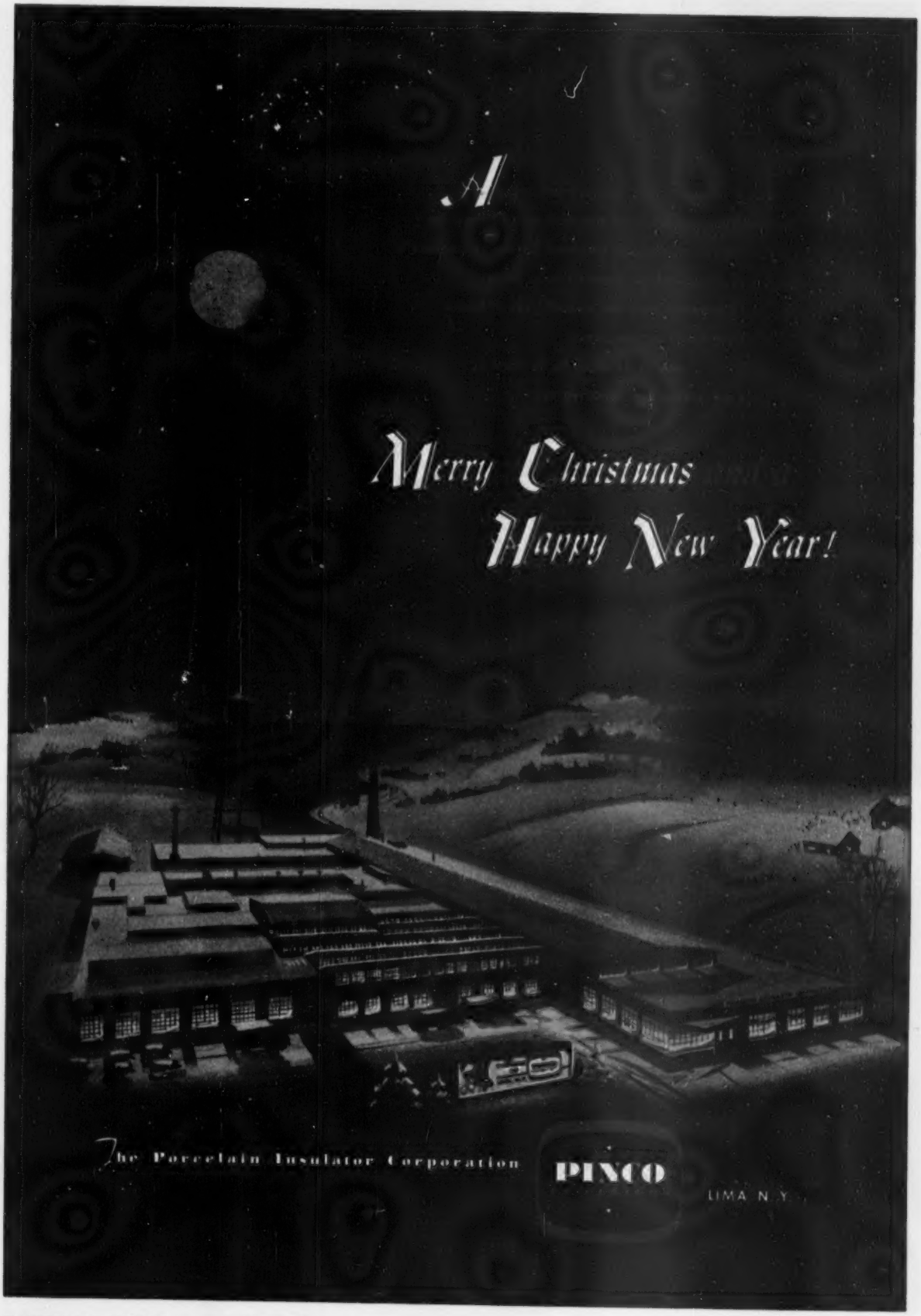
Dr Bennett S. Ellefson, director of research for Sylvania Electric Products, Inc, since 1946, has been appointed technical director of the company. Dr Ellefson, who joined Sylvania in 1937, succeeds **E. Finley Carter,** formerly vice president and technical director, who resigned to become head of research operations at Stanford (Calif.) Research Institute.

Harold J. Chase has been appointed manager-engineering of General Electric Co's small turbine and supercharger department. Since joining GE in 1924 as a test engineer, Chase has filled numerous engineering positions. Last April he was named manager-marine turbine sales in the small turbine and supercharger department of General Electric.

Leo E. Boissonnault, with Shawinigan Water & Power Co, Montreal, since 1952 as assistant to the vice president, finance, has been advanced to assistant vice president, finance. **A. C. Joncas** was appointed assistant treasurer and **Alex Timon** comptroller of the Canadian company. Both Joncas and Timon formerly were assistant comptrollers.

McGraw-Hill Appointees

McGraw-Hill Publishing Co has elected Paul Montgomery as executive vice president and a member of the finance committee. Nelson Bond, vice president and director of advertising, has been named executive vice president, Publications Division, to succeed Montgomery. Joseph H. Allen, manager of the Southern Pacific Division of the company at Los Angeles, has been made director of advertising with offices in New York. All these appointments become effective April 1, 1955.


A
Merry Christmas
Happy New Year!
The Porcelain Insulator Corporation
PINCO
LIMA N.Y.

NSP Staff Changes

A. H. Hamilton is advanced to purchasing manager to replace Brennan. Five others reassigned

A series of shifts and promotions in its general office operating department have been announced by Northern States Power Co.

A. H. Hamilton has been promoted to the position of manager of purchasing. Hamilton, more recently manager of Northern States Power's gas operations, succeeds J. J. Brennan, who has retired.

B. L. Nelson has been advanced to general superintendent of purchasing and stores. Since 1942 Nelson has been assistant to Brennan and purchasing agent of the Minneapolis Division.

J. W. Hoffman, who has been for the past year fuel engineer for the Northern States Power system, was elevated to manager of fuel procurement.

Succeeding Purchasing Manager Hamilton as general superintendent of NSP's gas operations is H. E. Peckham. For the past four years Peckham has been serving as superintendent of gas distribution for the St. Paul Division. Peckham's successor is Ralph H. Meserve, a veteran NSP employee.

John V. Anderson, who has been property protection engineer for Northern States Power for the past 13 years, has been transferred to the research, construction and insurance department in the capacity of general superintendent of insurance and property protection.

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Hyman D. Nathan and **George J. Leibman,** co-managers of sales operation and methods bureau of Consolidated Edison Co of New York, Inc, have retired from active service. Nathan, who started with New York Edison, a predecessor company, has a 44-year service record and Leibman, who began with Brooklyn Edison Co, another predecessor, rounds out 45 years.

Joseph C. Rengel has been made manager and **Philip N. Ross** assistant manager of the LSR (large ship reactor) project of the Atomic Power Division of Westinghouse Electric Corp. Rengel, with Westinghouse since 1937, recently came to the division from the Pittsburgh, Pa., headquarters position of assistant to the sales manager, defense products. Ross, who began with the firm in 1939, is formerly a manager of the division's reactor department.

Henry V. Nye, consulting engineer for switchgear equipment at Allis-Chalmers Manufacturing Co, has retired. Nye, an electrical engineer, is a veteran of 48 years' service with A-C. For many years he was engineer-in-charge of switchgear design before being made consulting engineer in 1949.

Joseph B. Inferrera has been named executive engineer at the Wellsville, N. Y., plant of Worthington Corp. Inferrera, formerly chief mechanical design engineer, joined Worthington in 1937 as a turbine design engineer.

George Caddoo has been appointed sales promotion manager of Philco International Corp. Caddoo, previously in the appliance sales department, succeeds **Victor Alin** who has been placed in charge of special sales for the International company.

John M. Birkenstock has retired as general manager and director of Green Fuel Economizer Co, Inc, after 30 years' association with the Beacon, N. Y., firm. During that time he also served as vice president and treasurer and originally was in charge of sales. Before joining Green Fuel he was employed by Babcock & Wilcox Boiler Co as designing engineer and estimator.

Long Joins Editorial Staff of Electrical World

Allen A. Long has joined the staff of Electrical World as an assistant editor. He has had experience in both utility and editorial work.

Following graduation from Virginia Polytechnic Institute where he studied electrical engineering, Long went to work for Appalachian Electric Power Co as a substation engineer. He had previous experience with the company during summer vacations.

He left utility work to get his master's degree in journalism from Emory University in Georgia.

During the past two and a half years Long has been on the staff of Science Service at Washington.

OBITUARY

C. J. Griffith, 89, who had been actively engaged in the utility field for over a half century before retirement in 1935 as vice president and general manager of Arkansas Power & Light Co, died Nov. 18 at Little Rock, Ark. After serving with Pine Bluff Water & Light Co as superintendent, Griffith in 1892 joined Little Rock Traction & Electric Co. He was that utility's general manager when Arkansas P&L was organized in 1926 and took over Little Rock operations. At that time Griffith became vice president and general manager.

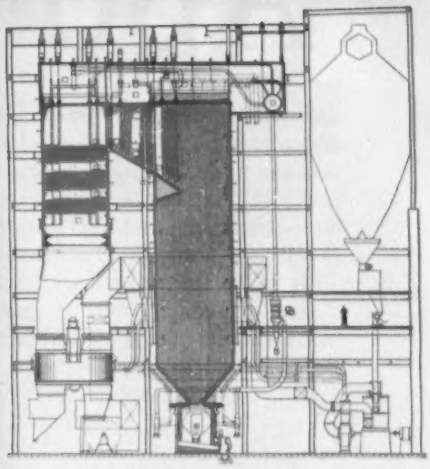
Clovis M. Converse, 69, who retired as assistant sales manager of G&W Electric Specialty Co, Chicago, in January, 1952, died Nov. 15. Converse, who resided at Batavia, Ill., joined G&W in 1927.

John Boswell Whitehead, a founder and former dean of the School of Engineering at Johns Hopkins University and professor emeritus of electrical engineering, died Nov. 16 at Baltimore, Md. Whitehead, internationally known as a pioneer in electrical engineering, was awarded the Edison Medal of the American Institute of Electrical Engineers in 1941. He served AIEE as president in 1933-34. He received an electrical engineering degree from Hopkins in 1893 and a doctorate in 1902. After working with Westinghouse Electric Corp, Bureau of Standards, Carnegie Institute, and former Niagara Falls Power Co, he joined the Hopkins faculty. He retired in 1942 as director of Hopkins' School of Engineering.

Marion S. Barnes, 63, Pacific district manager of electric utility sales in the Apparatus Sales Division for General Electric Co, died Nov. 10 at Berkeley, Calif. An engineering graduate of the University of California in 1914, Barnes joined G. E. the same year at Schenectady as test engineer, returning to San Francisco in 1918. This year was his 40th year with GE.

PERFORMANCE RECORD

EASTLAKE PLANT



One of the three C-E Controlled Circulation Boilers now in service at Eastlake. Each serves a 100,000/125,000 kw turbine-generator operating at a throttle pressure of 1800 psi with a primary steam temperature of 1050 F, reheated to 1000 F.

Three C-E Controlled Circulation Boilers are now in service at Eastlake Plant of The Cleveland Electric Illuminating Company. The first of these started September 17, 1953; the second, September 21, 1953; and the third, August 26, 1954. Performance records of Boilers No. 1 and No. 2 for periods of 12 months and 8 months respectively show the following principal results:

AVAILABILITY	Boiler No. 1	98.1%
	Boiler No. 2	98.4%
USE FACTOR	Boiler No. 1	91.3%
	Boiler No. 2	92.2%
CAPACITY FACTOR	Boiler No. 1	113.8%
	Boiler No. 2	116.3%
EFFICIENCY	Boiler No. 1	89.2%
	Boiler No. 2	89.4%

COMBUSTION ENGINEERING

Combustion Engineering, Inc.

200 Madison Ave., New York 16, N.Y.

BOILERS, FUEL BURNING & RELATED EQUIPMENT; PULVERIZERS, AIR SEPARATORS & FLASH DRYING SYSTEMS; PRESSURE VESSELS; AUTOMATIC WATER HEATERS; SOIL PIPE

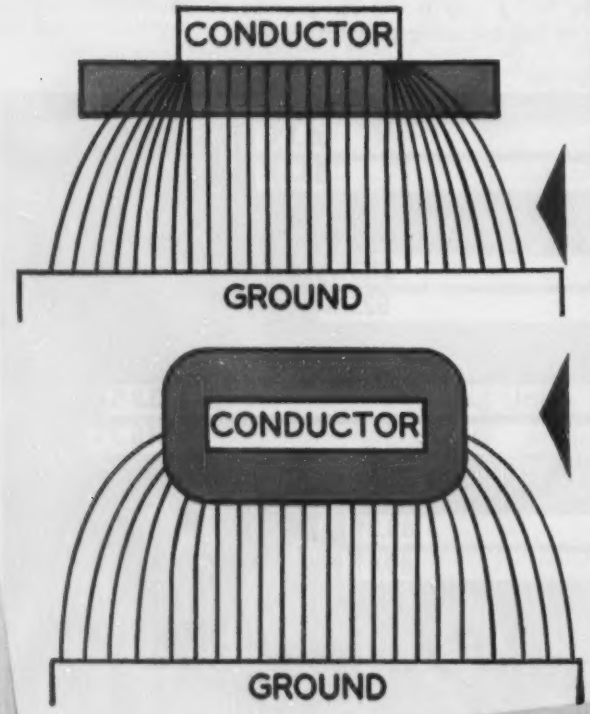
Why Worry About Corona?

Corona can be eliminated: Tests of many different designs and insulations over long periods under extreme voltage conditions prove it. Lessons learned from these tests have been applied at the thousands of points in a transformer where corona may develop. This is the first step in elimination of this damaging phenomenon. Proper dimensions, modifications in shapes, and careful application of latest insulation techniques are needed.

Allis-Chalmers applies these principles to all its power transformers. As a result, from the design standpoint, they merit the reassuring designation "corona-free."

But Allis-Chalmers does not stop with design. In addition, each transformer is thoroughly tested before shipment to provide a final check. When you buy an Allis-Chalmers power transformer you get a transformer that stays young because there is no corona that can cause damage.

How Corona Cuts Transformer Life



Corona is the cause of unexpected failure. It is a condition created by slight weaknesses in insulation or design. Its effects are cumulative. Although at the beginning corona is hard to detect, eventually it will develop into arcing and failure.

Using a simple dielectric structure, the diagrams show how corona develops and how it can be eliminated. Flux lines in the upper diagram illustrate how concentration at sharp corners of a conductor tend to cause very high stress at these points. If the stress is high enough, corona can develop and grow to the point where flashover must occur.

The lower diagram shows how to eliminate corona. Use of proper dimensions, correct insulation thicknesses, and modified shapes permits development of a structure in which corona cannot develop even under breakdown voltages.

Each of the thousands of points in a transformer where corona may occur is designed and tested to eliminate this possibility. Thus, Allis-Chalmers transformers earn their designation, "Corona-Free."

A-4438

ALLIS-

This 125,000-kva Allis-Chalmers power transformer operates at the Far Rockaway Station of the Long Island Lighting Company. It was built to operate at 76 db, 9 db under standard sound levels. It is a forced-oil-air unit with an air-to-oil radiator type heat exchanger.

CHALMERS

A-C ALLIS-CHALMERS

MILWAUKEE 1, WISCONSIN

There's more than meets the eye–

in Honeywell instrumentation

SPECIALIZED Application Engineering is one of the most important extra values you get in Honeywell instrumentation. Although it's unseen, it's a vital part of your measuring and controlling equipment . . . for it's what assures you of getting most effective utilization of the instrument performance that you buy.

Here's how this service works for you. First, a Honeywell field man sits down with your engineers, production men and instrument technicians. He digs out the facts about your process . . . finds out what needs to be measured or controlled, to what accuracy, under what conditions.

Then Honeywell's Application Engineering staff gets the problem. This group includes men who have first-hand experience in the instrumentation technology of a particular industry. Some specialize in chemical processing . . . others in metal-working . . . others in petroleum. Together they add up to an unequalled storehouse of knowledge on how to use modern instrumentation in modern production. They engineer your complete system . . . including not only the selection of instruments, primary elements and controls, but also the accessory switches, signals and interlocks that add distinctive features of convenience and safety.

Honeywell Application Engineering takes a big burden off your own engineering staff. And it pays dividends in performance that spells real production economy, consistent quality and simplified maintenance.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, Wayne and Windrim Avenues, Philadelphia 44, Pa.

MINNEAPOLIS **Honeywell**

BROWN INSTRUMENTS

First in Controls

Better Storing and Control . . .

. . . of utility equipment and supplies are discussed by Pacific Coast Electrical Association. Bill collecting gets attention

With the theme, Treasure Hunt for Net, the administrative services section of the Pacific Coast Electrical Association held a joint fall conference with the accounting section of the Pacific Coast Gas Association in San Francisco, Nov. 18-19.

As much thought should be devoted to the design of the warehouse as is given to use of mechanized handling equipment and maximum use of storage space, George E. Haruff, Pacific Gas & Electric Co, told the session on stores. He described a functional and efficient warehouse developed for use by the armed forces. It is a one-story structure with no dead space required for stairways, elevators or supporting columns. Long span roofs give unimpaired floor space for storage and flow of materials.

Scrapping Cheaper than Repair? . . . When major repairs are required on distribution transformers, said R. E. Fritzer, San Diego Gas & Electric Co, the economics of sending them off for repairs vs scrapping and buying new units should be investigated. In his case, labor, materials, and freight charges about add up to the cost of a new unit less salvage. In scrapping transformers it was advantageous to sell the entire unit in groups to junk dealers on a competitive basis. Proceeds currently ran about $1.10 per kva.

Several examples of what a stock control program might do were presented by A. W. Holt, Arizona Public Service Co. The ordering of low-value stock items on an annual basis may prove economical. In some cases, the ordering of materials and stores issues may be heavy enough to justify delivery directly by the vendor to substores. If central stock facilities are overtaxed, it may pay to have small orders shipped directly to substores.

Vendors' Stocks Should Be Adequate . . . Members attending the session were unanimous in the opinion that vendors should stock items for the buyer. However, the amount and variety they should carry are difficult to determine because of price competition and other considerations.

How to do a better and less-costly job of supplying acceptable service should be reviewed continually. Acceptable service, said John T. Kimball, vice president, Idaho Power Co, is the level of service that just meets the requirements of a customer or class of customers. Overdoing acceptable service is what costs more money.

The credit and collection session heard that the telephone is a fast and cheap means of collecting overdue bills. J. A. Lopez, Pacific Telephone & Telegraph Co, said use of the phone does not destroy public relations and still effects a fair ratio of settlement. Time-payment arrangements can be arranged more easily over the phone.

Our training program for credit and collection employees is built on the positive approach, said A. E. Press, Utah Power & Light Co. This approach toward the delinquent customer, without any indication of pressure, is presented to all "customer-contact" employees. The program has reduced significantly the amount at risk.

Savings through a reduction in the volume of due-bill notices were greater than the increase in chargeoff to bad debt, said G. H. Larsen, Southern California Edison Co. C. T. Diskon, Arizona Public Service Co, added that district office personnel are more effective in collecting overdue bills. They understand the problems of customers and can more easily effect a settlement.

MEETINGS CALENDAR

21ST NATIONAL POWER SHOW
Sponsored by American Society of Mechanical Engineers, Commercial Museum, Philadelphia, Dec. 2-7.

INTERSTATE POWER CLUB
Hotel Martinique, New York, Dec. 6.

EDISON ELECTRIC INSTITUTE
Street Lighting Committee, Boston, Dec. 7-8; Commercial Cooking and Water Heating Committee, Jefferson Hilton Hotel, St. Louis, Dec. 8-10; Industrial Relations Committee, EEI Headquarters, New York, Dec. 16; Industrial Relations Committee, EEI Headquarters, New York, Jan. 20; Prime Movers Committee, Grand Hotel, Mobile, Ala., Jan. 31-Feb. 1; Home Service Committee, Washington, D. C., Feb. 4-5; Accident Prevention Committee, Shoreham Hotel, Washington, D. C., Feb. 9-10; Transmission and Distribution Committee, Shoreham Hotel, Washington, D. C., Feb. 10-11; Industrial Relations Committee in conjunction with AGA at AMA Mid-Winter Personnel Conference, Palmer House, Chicago, Feb. 14; Electrical Equipment Committee, Deshler Hilton Hotel, Columbus, Ohio, Feb. 14-15; Commercial Electric Space Heating and Air Conditioning Committee, St. Louis, Feb. 17-18; Residential Promotion Committee, New York, Feb. 17-18; Accounting Conference, Planning, Edgewater Beach Hotel, Chicago, Feb. 17-18; 1st Street Tree and Utility Conference, co-sponsored with EEI Transmission and Distribution Committee and Street Lighting Committee of Illuminating Engineering Society, Wade Park Manor, Cleveland, March 3-5, 1955.

EASTERN JOINT COMPUTER CONFERENCE EXPOSITION
Sponsored jointly by American Institute of Electrical Engineers, Institute of Radio Engineers, and Association for Computing Machinery, Bellevue-Stratford Hotel, Philadelphia, Dec. 8-10.

NORTHEASTERN WEED CONTROL CONFERENCE
Annual Meeting, New Yorker Hotel, New York, Jan. 5-7, 1955.

ELECTRICAL EQUIPMENT REPRESENTATIVES ASSOCIATION
Annual Meeting, Breakers, Palm Beach, Florida, Jan. 10-12, 1955.

***NATIONAL ASSOCIATION OF PURCHASING AGENTS**
Third Region, Jefferson Hotel, St. Louis, Jan. 13-14; 24th Annual Mid-Winter Conference, Public Utility Buyers' Group, Shamrock Hotel, Houston, Tex., Feb. 13-15, 1955.

***AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS**
High Frequency Measurement Conference, Hotel Statler, Washington, D. C., Jan. 17-19; Winter General Meeting, Hotel Statler, New York, Jan. 31-Feb. 4, 1955.

DOBLE ENGINEERING CONFERENCE
22nd Annual Meeting, Sheraton Plaza Hotel, Boston, Jan. 24-28, 1955.

PACIFIC COAST ELECTRICAL ASSOCIATION
Business Development Section, Hotel Californian, Fresno, Calif., Jan. 27-28; Conference on Electronic Integrated Data Processing, Hotel Statler, Los Angeles, Feb. 23-24; Engineering and Operating Section Conference, Hotel Huntington, Pasadena, Calif., March 7-8, 1955.

MISSOURI VALLEY ELECTRIC ASSOCIATION
Industrial and Commercial Sales Conference, President Hotel, Kansas City, Mo., Feb. 3-4, 1955.

PENNSYLVANIA ELECTRIC ASSOCIATION
Winter Meeting, Relay Committee, Hotel Roosevelt, Pittsburgh, Feb. 3-4; Winter Meeting, Electrical Equipment Committee, Benjamin Franklin Hotel, Philadelphia, Feb. 17-18, 1955.

NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION
Annual Meeting, Convention Hall, Atlantic City, New Jersey, Feb. 14-17, 1955.

SOUTHERN SAFETY CONFERENCE-EXPOSITION
Jung Hotel, New Orleans, La., Feb. 27-March 1, 1955.

*Additions this week.

New California Housing Tract Is Testing Ground That Proves . . .

Self-Protected Transformers Effective in Banked Secondary

E. H. CLARK, Assistant Chief Distribution Engineer, Southern California Edison Co, Los Angeles, Calif.

Banking transformer secondaries reduces effectively average transformer demand per consumer, more consumers being served from a single system. Southern California Edison recently tried such banking in a new residential area. By taking greater advantage of the diversity among individual peaks, the utility effected considerable savings in installed transformer capacity.

In addition to these advantages Edison obtained others peculiar, perhaps, to its own system, such as:

1. Elimination of primary cutout hardware which is subject to corrosion in a coastal atmosphere.
2. Elimination of leakage current over the cutout to the crossarm, a frequent cause of pole-top fires.
3. Reduction of secondary connections and connectors.

Residential Installation . . . A preliminary investigation of the features of self-protected banking transformers indicated that their features were economically worthwhile. It also prepared Edison for installing a fairly large quantity of the transformers in a residential area then under development.

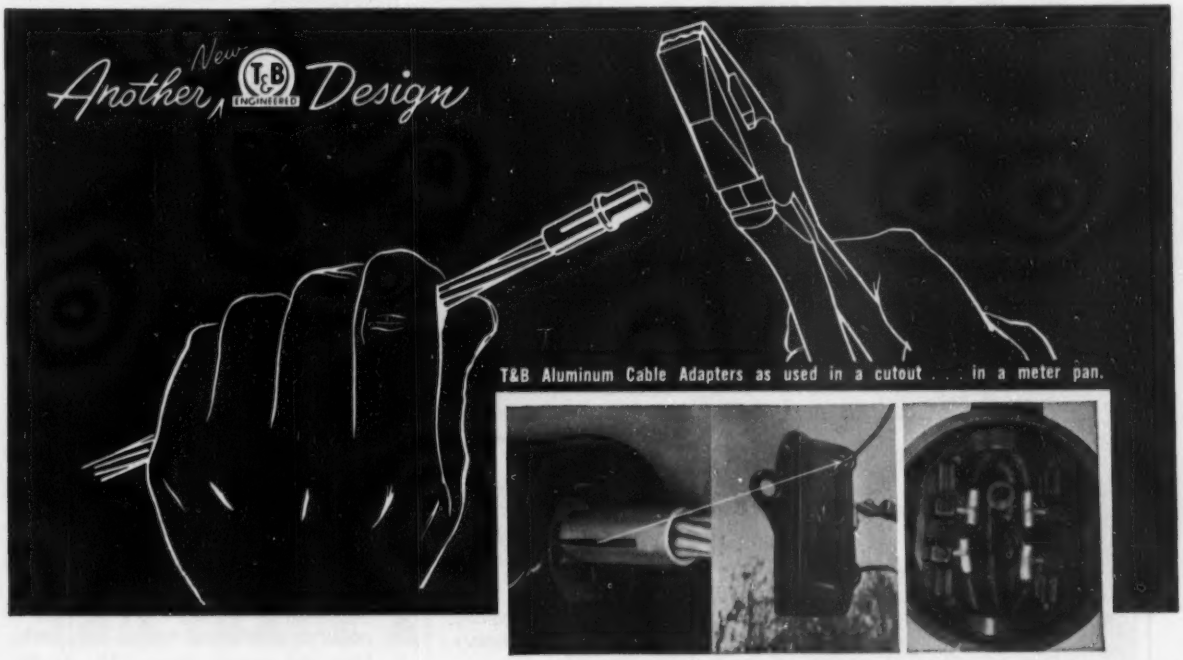
The chosen area provided an excellent proving ground for an economic and operational analysis of transformer secondary banking.

The community selected is in the rapidly expanding Lakewood area east of Long Beach. It consisted of 1,908 homes, each having about 1,200 sq ft of livable area and equipped originally with 4.72 kw of appliance load, consisting of a 440-w dishwasher, an 800-w dishwasher heater, a 780-w garbage disposal unit, and two bathroom heaters, 1,350 w each. Each family also has the usual toaster, waffle iron, radios, and refrigerator, and local television saturation is just less than 100%.

IF YOU'RE WIRING WITH ALUMINUM . . .

Utility Engineers are now installing aluminum cable in many places where only copper had been suitable. Equipment such as transformers, capacitors, cutouts, switches, and meter pans, having terminals designed for copper conductors, are now being wired to aluminum and A.C.S.R. with little or no difficulty.

How? T&B's new Aluminum Cable Adapters. They're made of heavily-tinned copper alloy; take up little more space than the cable; install in a jiffy. A lineman or electrician merely taps one onto the end of the conductor, then clamps the adapter as though it were copper conductor. "Straight" and "flag" types are available. The flag type is best for connections at right angles to cable outlets.



T&B Aluminum Cable Adapters as used in a cutout . . . in a meter pan.

One of the outstanding features of these new adapters is the serrated bore. As the adapter is tapped onto the cable, the serrations bite through the aluminum oxide coating. The high-conductivity connection thus formed is maintained, despite weather and moisture, by an oxide inhibitor precoated in the bore. The clamp end is slotted and spring-like to maintain pressure during thermal expansion and contraction.

These versatile Cable Adapters are opening up many new applications for aluminum cable. Sizes for cable up to #2 Str. at present. If you're wiring with aluminum, you might possibly have a unique application. If so, let us know about it. We'll be glad to send you a free sample of the adapter and descriptive literature. Write to The Thomas & Betts Co. today.

Note how the bore serrations have scraped through the oxide coating on the cable end.

LOOK FOR THIS SIGN — AUTHORIZED DISTRIBUTOR T&B ENGINEERED

IT'S THE MARK OF AN AUTHORIZED T & B DISTRIBUTOR

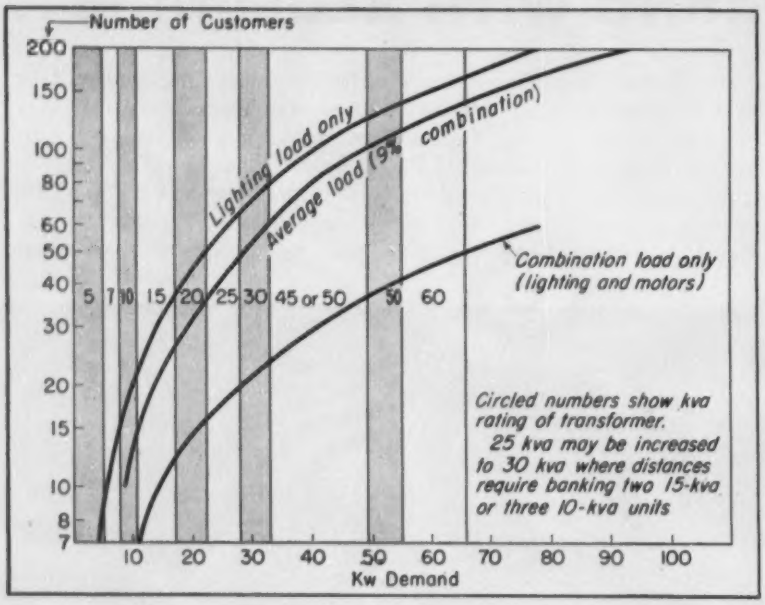
The complete line of T & B fittings for conductors and raceways is sold only by recognized electrical wholesalers. It's our way of assuring you the service and savings of a friendly local source. Call him for all your electrical needs. T-415

THE THOMAS & BETTS CO.

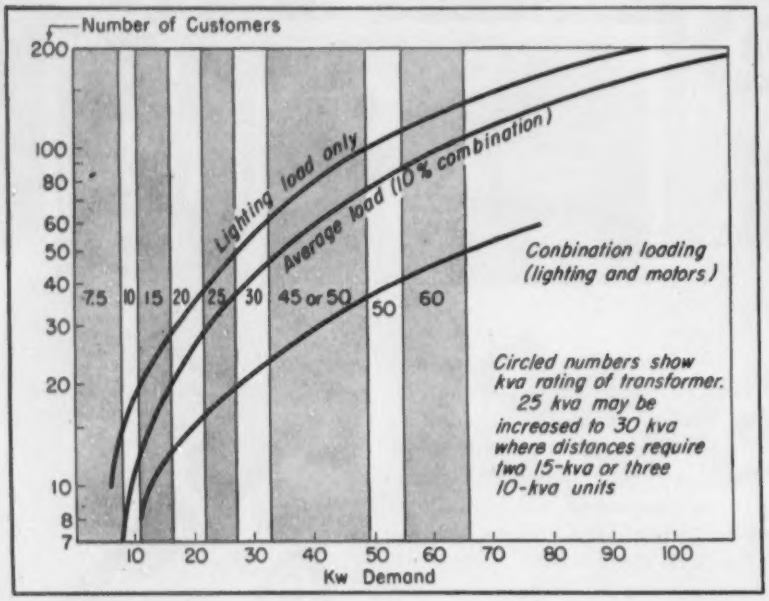
INCORPORATED

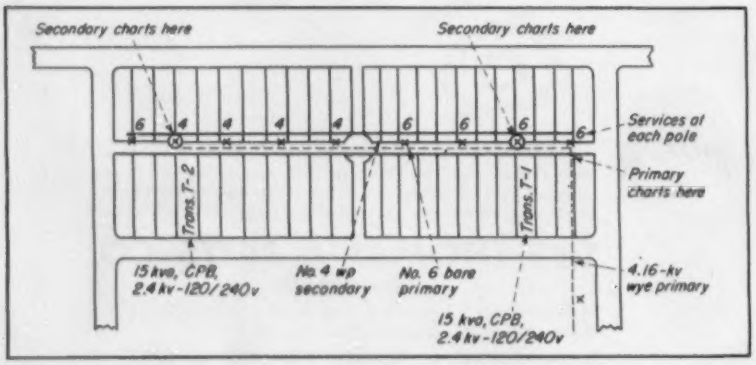
14 Butler Street • Elizabeth 1, New Jersey
Thomas & Betts Ltd., Montreal, P.Q., Canada

MANUFACTURERS OF FINE ELECTRICAL FITTINGS SINCE 1898



KVA PER CUSTOMER on a 30-min demand basis will meet initial demand of homes having less than 1,150 sq ft (above) and from 1,150 to 2,000 sq ft (below) of floor space





Edison determined transformer kva per customer by means of the accompanying curves. These represent initial, total, and average demand for any given number of new homes on an individual secondary system. This demand, Edison's experience showed, is the average initial requirement of such a home tract when the saturation of appliances is low.

Appliance Saturation . . . The increase in saturation of appliances in a new development to what might be considered the average for southern California produces a maximum load of 140-150% of rated transformer capacity. Demand in the vicinity of this load is maintained for two to three hours over the evening peak-load period. This is considered a quite desirable situation.

The 1,908-home area where commercial development had not yet started is served from a 4.16-kv, wye primary having radial distribution from a feedpoint 12,561 ft from the 11/4-kv substation. The feeder is 2/0 bare copper on a 20.5-in. spacing, and the mains are Nos. 2, 4, and 6 bare copper.

Average Customer Demand . . . Recording voltmeters, a recording ammeter, and maximeters were installed on the primary, transformer, and secondary, as shown, before the week-long test period began. The feeder peak-ampere reading at the substation was used to determine average customer demand for two to three hours over peak.

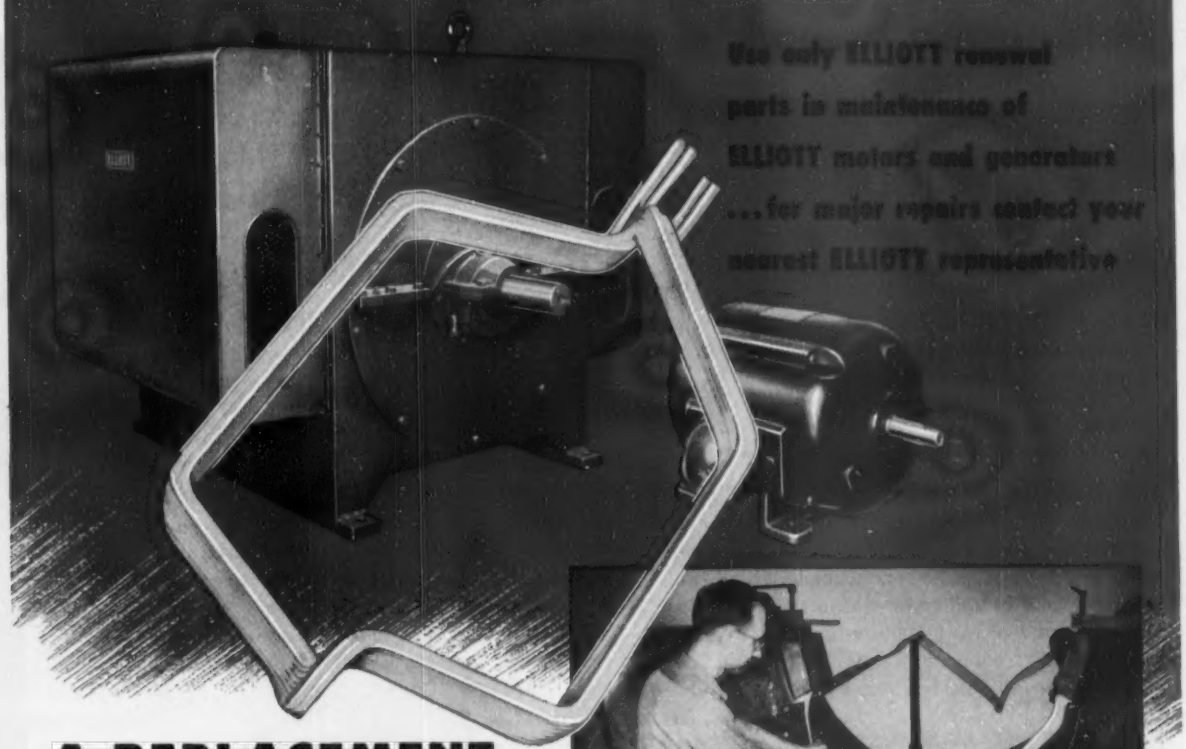
This customer demand was calculated to be 660 va average per house. At the same time maximeters and the recording ammeters indicated the demand for 46 homes to be 42.5 kva, or 920 va per house.

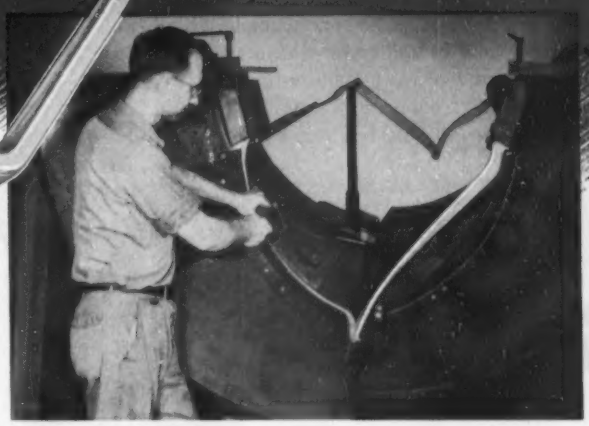
More readings were taken to determine the change in peak demands when only portions of the secondary system are considered. The maximeters on the secondaries of a transformer feeding towards the ends of the banked system indicated a total of 17.7 kva, or 1,050 va per house. The va demand per house for the 29 homes between two transformers was 755 va.

RECORDING INSTRUMENTS were located on banked secondary system serving 46 homes. Average 920-va individual demand was 12.4% below average maximum of 1,050 va.

PLAY IT SAFE!

Use only ELLIOTT renewal parts in maintenance of ELLIOTT motors and generators ...for major repairs contact your nearest ELLIOTT representative





A REPLACEMENT COIL THAT'S A TRUE DUPLICATE

of the original coil is the only assurance of continued high performance. The special form in the photo above produces coils absolutely uniform in shape. Only one of these coils can correctly replace another coil from the same machine.

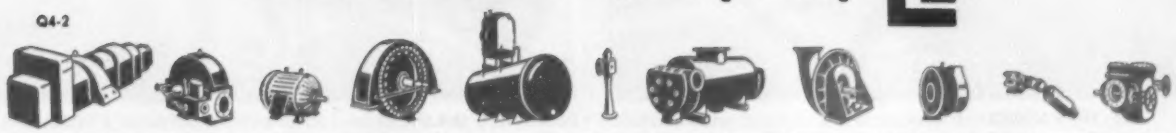
ELLIOTT ROTOR COILS ARE BAKED UNDER PRESSURE for homogeneous structure and close tolerance, and are properly treated at several points of manufacture with best grade insulating varnishes.

ONLY THE BEST AVAILABLE INSULATING MATERIALS, proven so in constant test, are used in Elliott coils. Insulation practice is considerably beyond standard practice for the voltage of the machine, insuring longer life, highest performance.

FOR BEST RESULTS have coils installed by Elliott factories or Elliott approved service shops. Ask your local Elliott field engineer for location of the shop best suited to serve you. Elliott Company, Ridgway Division, Ridgway, Pa.

ELLIOTT Company

Q4-2



TURBINE-GENERATORS TURBINES MOTORS GENERATORS DEAERATING HEATERS EJECTORS CONDENSERS COMPRESSORS TURBOCHARGERS TUBE CLEANERS STRAINERS

ALL NEW G-E CAPACITOR

Field-tested assembly over 50 percent stronger handles one or two copper or aluminum lines; exerts 1000 lbs. contact pressure through corrosion resistant connector.

Every General Electric outdoor capacitor with glass bushings now has a stronger terminal that's far easier to handle.

Here are the details that give this sturdy new terminal its practical advantages:

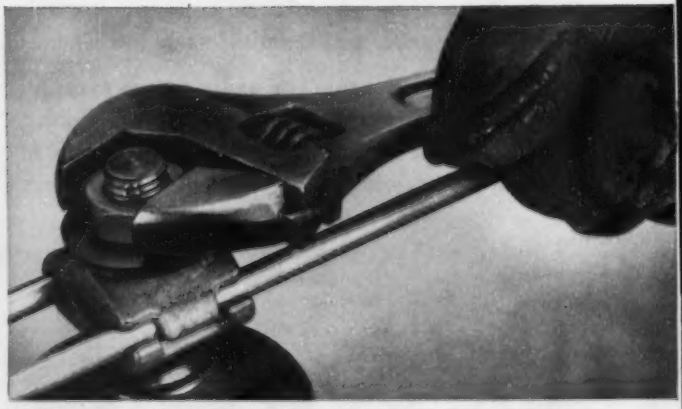
1. Conductors can be quickly inserted in the assembly without threading. **2.** One or two copper or aluminum conductors from No. 10 AWG solid to No. 2 AWG stranded can be clamped securely. **3.** Two Belleville washers exert a constant pressure of over 1000 pounds, forcing the parallel-groove connectors to follow the cold flow of aluminum. **4.** The hex nut will strip without damaging the terminal stud if excessive tightening torque is applied. It can easily be replaced with a new nut. **5.** Accidental loss of this nut is reduced because the top threads on the terminal stud are staked. Yet, if necessary, the nut can be forcefully removed. **6.** The parallel-groove connector is tin-plated to provide good conductivity and minimize corrosion.

Every element of this design has produced a strong and dependable terminal assembly requiring a minimum of time and effort to connect. Ask your G-E Apparatus Sales Engineer for more information. General Electric Company, Schenectady 5, New York. 441-23

Progress Is Our Most Important Product

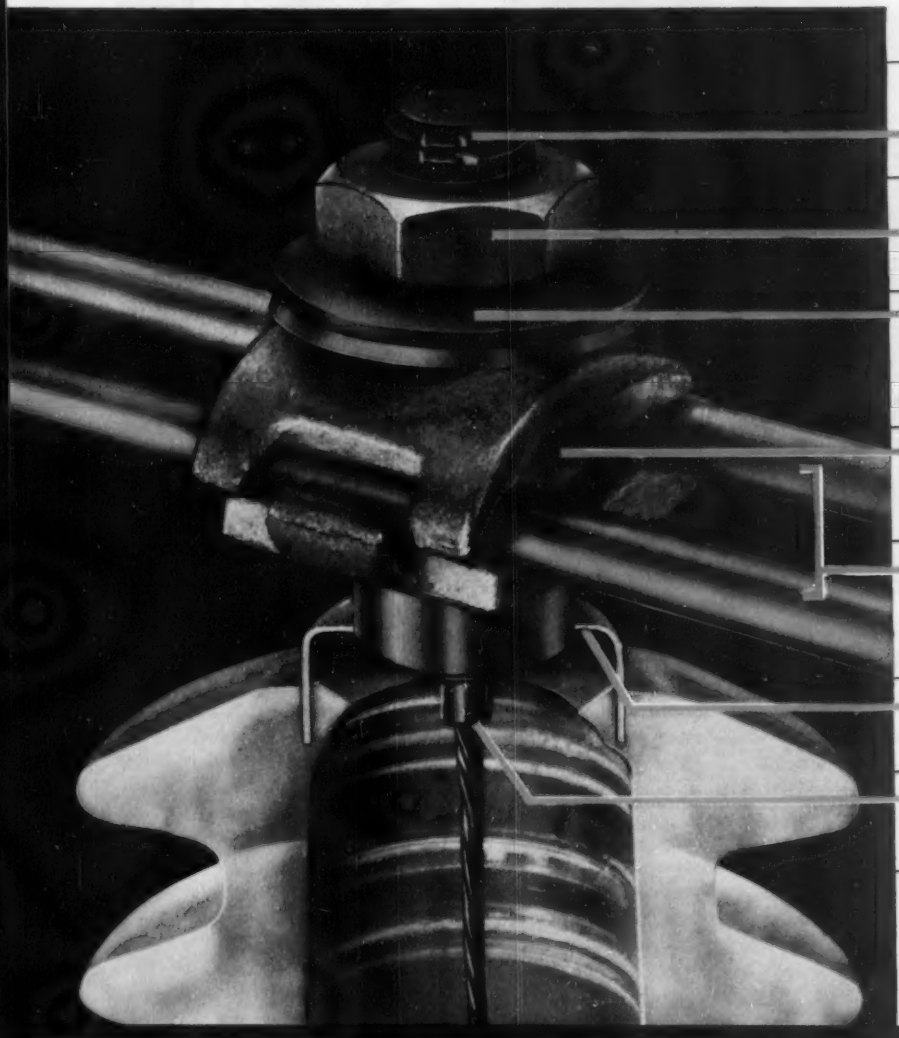
GENERAL ELECTRIC

NO THREADING of conductors is needed with parallel-groove connector. Loosen nut and conductors slip in place.



BELLEVILLE WASHERS maintain over 1000 pounds contact pressure on connector. Flat washers indicate proper torque.

TERMINAL *at no price increase!*



STAKED THREADS
keep assembly from being accidentally removed

NUT STRIPS FIRST
if excess torque is applied, avoiding damage to stud

POSITIVE CLAMPING
with Belleville washers follows cold flow if aluminum conductors are used

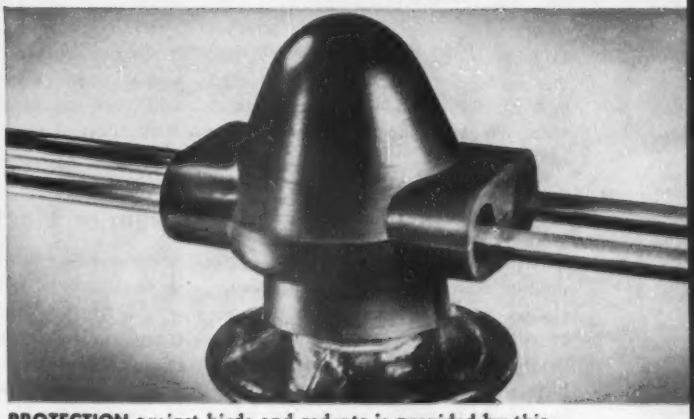
TIN-PLATED CONNECTOR
provides good conductivity and minimizes corrosion

HOLDS 1 OR 2 AL OR CU CONDUCTORS
from No. 10 AWG solid to No. 2 AWG stranded

PRESSURE-BRAZED TO CAST-IN-GLASS FLANGE

CRIMPED AND BRAZED LEAD-WIRE CONNECTION

NUT STRIPS BEFORE THE STUD, preventing damage to stud threads due to excess torque. Nut can easily be replaced.



PROTECTION against birds and rodents is provided by this rubber cap which fits securely over the entire assembly.

Westinghouse Electric Corp Photo

YOUNG PIGS THRIVE in farrowing barn equipped with heat pump. A decrease in fatalities plus lower labor costs and less disease have been noted by farmer since installation of the unit

Heat Pump Sends More Pigs to Market

Even pigs now have the heat pump.

Conner Prairie farms near Indianapolis, Ind., have been using a five-ton unit to help farrow hogs and the results, they report, are entirely satisfactory.

Greatly increased swine production, lower initial investment and operational costs, plus reduced fire hazards were named by Tilman Bubenzer, farm manager, as outstanding heat pump advantages.

Bubenzer said the main purpose of the heat pump is to have management control over the farrowing barn temperature regardless of outside weather conditions. In this way, multiple farrowing can be planned and conducted year-around instead of seasonally, and valuable barn space is utilized to the utmost.

"We are still in the process," Bubenzer said, "of collecting swine production data as a result of using this heat pump. Although our overall production has increased since it was installed, we particularly observe a decrease in swine fatalities during that crucial two week period after birth. Temperature control also allows early weaning, and so the turnover of sows is greater."

"Labor costs are cut considerably," Bubenzer said, "since the heat pump has eliminated much of our care, cleaning and feeding problems. We believe the health of our swine has improved as a result of the heat pump, and fatalities due to disease have been reduced. The system provides uniform heat and cooling throughout the barn, and there are no drafts. Insects, dust and odors have been all but eliminated."

The heat pump is installed in the loft of the farrowing barn, where it occupies no more space than an average size furnace. It maintains a minimum temperature of 65 F in the winter, and 72 F in the summer. Warm and cool air is distributed through barn ducts.

Atom or Electricity?

Atomic energy may be used directly in some specialized heating processes in the future, "but in the end, electricity will take over the main heating load." This was recent statement of Francis K. McCune, general manager of General Electric Co's Atomic Products Division.

Electric Heating . . .

. . . will be plugged by Pacific Gas & Electric in all out '55 program to beat summer peak

Electric Space heating and home wiring financing will get heavy promotion in Pacific Gas & Electric Co's 1955 sales plans just announced.

Satisfied with its present reserve capacities, PG&E hopes to build its winter load with space heating and offset a growing summer peak brought on by air conditioning and irrigation pumping.

The heating campaign will be launched in January with ads in some 300 newspapers and the January issue of "Sunset" magazine. Bill stuffers plus 350 outdoor poster boards and 2,500 truck banners will carry the electric heating story to all parts of the system. In addition, retailers of electric heating equipment will be invited to display their heaters along with company displays in local PG&E offices.

The home wiring finance plan being promoted by PG&E and the Northern California Electrical Bureau is being handled on a cooperative basis with several California banks and lending institutions. It allows re-wiring financing either in combination with an appliance sale or as a job in itself. PG&E believes the plan will prove a valuable aid in selling electric space heating as well as stepping up sales of the regular high-use appliances.

PG&E will recommend only those electric heating installations which are properly sized and complete house heating jobs only where there is insulation at least in the ceiling. The company feels that customer satisfaction and the best competitive basis for electric space heating can be attained only by proper sizing, sound engineering of all installations, and use of insulation to minimize the cost of operation.

While PG&E will do the promoting, it will be up to electrical equipment retailers and contractors to follow-through and actually make the sale. For this reason, PG&E previewed its promotion before a meeting of heating equipment manufacturers, distributors and contractors on Oct. 28.

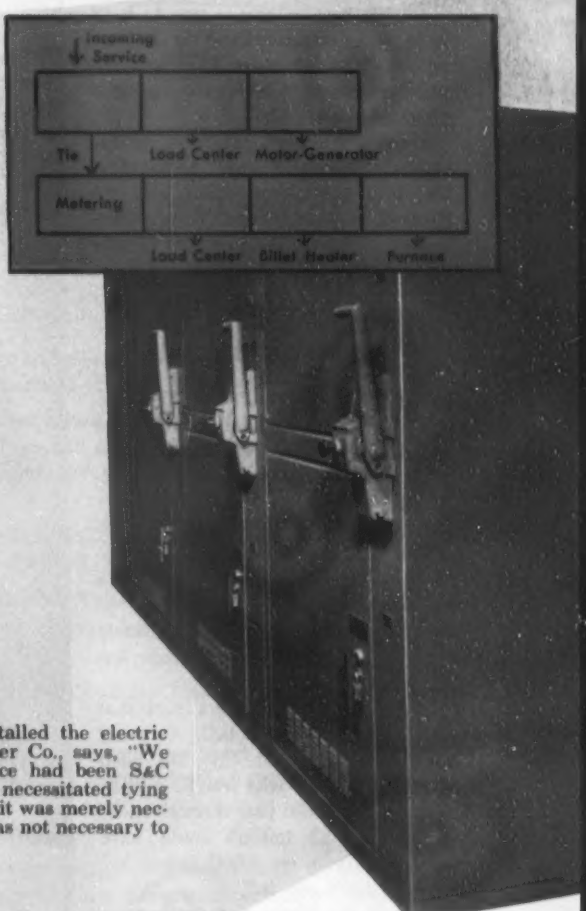
Engineer your high voltage supply system at lowest cost with

S&C Metalclad Switchgear

Geo. M. Baxter, Plant Engineer at Harper, points to tie unit.

THE H. M. Harper Company did! This company, located in Morton Grove, Illinois, manufactures nonferrous fastenings. A few years ago it began a long range plant expansion program by modernizing its electrical system — distributing its power at high voltage.

The first step was installation of S&C Metalclad Switchgear—a 3-unit assembly which served a load center and a motor-generator, and provided a spare for future needs. Two years later a second 4-unit assembly was added to serve the new metals plant, and was tied to the incoming service through the spare unit of the original assembly.



Added S&C Switchgear serves a billet heater, furnace, and load center, and supplies metering.

S&C Metalclad Switchgear is engineered to perform all the necessary protective and switching functions—yet it costs only about half as much as most alternate equipment. As a result the economies from its use are often tremendous.

Mr. Don Rieger

of C & H Electric Co., who planned and installed the electric power distribution system at The H. M. Harper Co., says, "We were especially pleased that our original choice had been S&C Metalclad Switchgear when the latest changes necessitated tying the two switchgear assemblies together, because it was merely necessary to change fuses in the tie-in unit . . . it was not necessary to replace expensive breaker equipment."

Specialists in High-Voltage Switchgear for Electric Utilities since 1910

S&C ELECTRIC COMPANY

Plant and General Office: 4421 Ravenswood Ave., Chicago 40, Ill.

Consult your telephone directory. Sales offices located in Birmingham, Boston, Buffalo, Chicago, Clayton (St. Louis), Cleveland, Dallas, Dearborn (Detroit), Denver, Houston, Huntington, Indianapolis, Jersey City, Kansas City, Little Rock, Memphis, Minneapolis, New Orleans, Philadelphia, Pittsburgh, Portland (Ore.), St. Petersburg, Salt Lake City, San Francisco, San Gabriel (Los Angeles), Seattle, Syracuse, Washington, D. C. In Canada: S&C Electric Canada Ltd., Toronto and Montreal.

Eye Farm Market

(Continued from page 15)

committees to be organized on a trial basis. Presumably a decision to establish these groups on a permanent basis will depend on the results of the trial run.

The Schenectady meeting of the Farm Conference, held Nov. 18-19, was representative of its activities. It brought together representatives of state and national farm organizations, electric company and co-op utilities, manufacturers, distributors and dealers in farm equipment and appliances, and others interested in the intensive application of electricity on the farm.

But if the Conference was to have been strictly educational in its approach, it didn't show it. From the platform speaker after speaker emphasized the need to sell.

Gordon Loveless, president, Washington Electric Co-op, Montpelier, Vt., in a panel presentation said the farmers viewpoint was being overlooked. "There's just so much income on a farm. With other competitors after the business, too, the farmer must be shown that electricity can help him make more money."

One Way . . . To do this, R. T. Jones, Pennsylvania Power & Light Co, said a utility must have a written sales program to follow, backed by wholehearted management support.

Prof H. F. DeGraff, Cornell University, pointed out that new equipment requires the farmer to make a substantial capital outlay. Thus, he must be convinced that substituting electric for muscle power means less expense and larger profits.

"But not enough farmers think that way," said Nolan Mitchell, Aerovent Fan and Equipment Co. He cited Michigan farmers who lost $2 million worth of beans last year through spoilage. "That $2 million could have put crop dryers on 1,000 farms; yet farmers don't see it."

Part of the blame for the lagging farm program was laid to the industry's ineffective sales approach. Stanley Andrews, agricultural communications expert of Michigan State College, told the group they must "get in step with the farmer if you want to sell." He urged use of basic selling rules: Find out what the farmer wants, have something to meet that need, talk to him in simple terms, say it often.

Supplier Responsibility . . . As to getting dealers to better service and sell farm equipment, another panel placed much of the responsibility on the power supplier. He must work more closely with farm distributors and dealers and help them find their markets, the panelists said. The power supplier must help farmers with their individual electrical problems. The farmer isn't educated in the use of electricity. Neither are dealers nor distributors. That leaves the utility to do the teaching.

The following morning a third panel of speakers backed up REA's Strong by explaining what was being done to foster the Inter-Industry Council.

W. D. Hemker, Westinghouse Electric Corp, speaking for the manufacturers, suggested the industry apply the insurance companies' techniques in planning electrification programs for farmers. Hobart Beresford, Iowa State College, told how a Inter-Industry Council organization was set up in his state. H. S. Pringle, Federal Extension Service, outlined ways federal and college agencies would cooperate.

Drawing Brings Leads

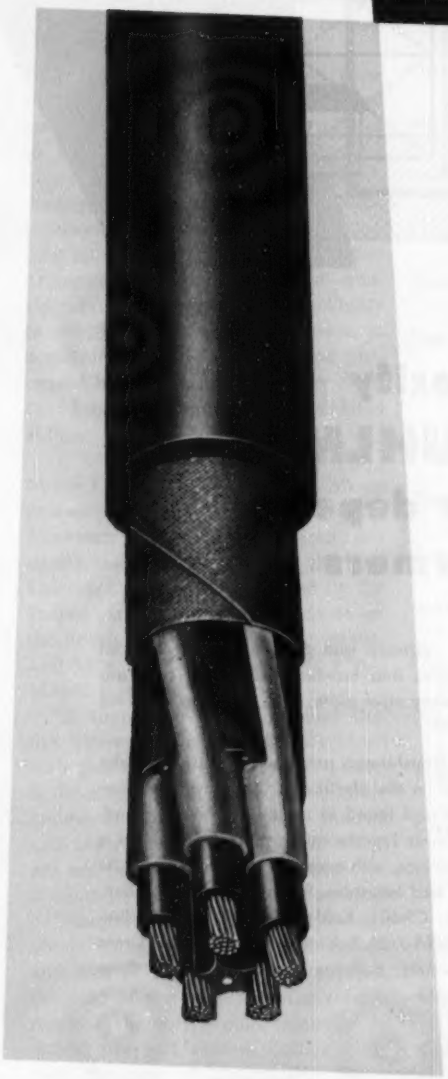
Dealers netted a new list of "live" prospects recently through a $20,000 drawing for electrical appliances sponsored by Northern California Electrical Bureau. Customers of Pacific Gas & Electric Co, carrying entry blanks they received with their PG&E bills, trouped into cooperating appliance stores, selected appliances they wanted to win in the drawing, and signed the blanks. The two-week promotion offered $1,650 worth of appliances as grand prize, $500 worth to the next 35 winners and 200-w lamp bulbs to the following 5,000 names drawn. Drawing was conducted by the Bureau.

Lights for Super Highway

Jersey Central Power & Light Co workman installs one of approximately 1,000 street lighting units which the company has placed in service on the newly-opened Garden State Parkway. Units extend for 65-miles along section of parkway passing through JCP&L territory. More than half of the lights are 20,000 lumen mercury vapor with the remainder 6000 lumen incandescents. Two other utilities, Atlantic City Electric Co and Public Service Electric & Gas Co serve remaining sections of the 165-mile-long super highway.

Aging characteristics of RoZone compounds, highly important to the life of the cable, are constantly checked by means of oxygen "bomb" and long-time heat tests.

5-conductor control cable RoZone insulated, Neoprene sheathed, outer sheath of RoPrene (Neoprene)—600 volts.



Rome RoZone®

Superior Ozone-Resistant Insulation Deserves Your CONFIDENCE

What its Excellent Aging Characteristics Mean to You

Q: Why have oil base compounds been recognized as superior for over half a century?

A: Partly because of excellent moisture and ozone resistance, but particularly because of their resistance to natural aging effects. Such cables are still operating satisfactorily today.

Q: How do we know that RoZone oil base compound has superior aging characteristics?

A: First, because it exceeds industry specification requirements. Second, because this type formulation has been time proved for over fifty years.

Q: Are the applications of RoZone limited by its aging qualities?

A: No. RoZone insulated cable can be used in practically any application because of its excellent aging properties. It is successfully installed direct in earth, in conduit, in racks, overhead and in combination runs.

In any installation where exceptional resistance to aging, corona and ozone cutting plus low dielectric loss and excellent electrical stability in water are required, Rome RoZone deserves your confidence.

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For more than half a century, Kuhlman Power Transformers have been providing a steady and dependable source of power for American utilities and industry. Built from finest quality materials and engineered for safe, economical operation, these units incorporate the latest design principles, many of which were developed by Kuhlman. Coils are dried under heat in vacuum to insure uniformly high insulation strength and then impregnated with thermosetting varnish to provide good mechanical strength. Insulation is coordinated to the basic impulse level. Windings are equipped with wide oil ducts for insulation and ample cooling. Oil is introduced under vacuum to prevent entrapment of air and insure high insulation strength. Construction throughout is sturdy and rigid. Structural steel core clamps hold the core securely in place to prevent shifting or vibration and provide support for coil braces, lead guides and terminal structures. Tanks are constructed of heavy steel plate, and sealed to minimize deterioration of oil.

Kuhlman Power Transformers are assembled by men who are highly skilled in the electrical crafts. They are thoroughly inspected and tested to meet rigid quality standards. Kuhlman Power Transformers can be produced in a wide variety of ratings, with accessories to suit the specific needs of utilities and industries. For complete information, write for Bulletin CS-601. Kuhlman also builds Distribution, Dry Type, Saf-T-Kuhl, Subway, CSP and Series Street Lighting Transformers. Bulletins are available on these models as well.

151-T

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SIXTY YEARS OF PROGRESS IN THE ELECTRICAL INDUSTRY

Moses Vs Clapp

Two fighters for public power disagree on merits of bringing St. Lawrence power to NYC

Do administrators of public power projects, backed by the public's money, acquire a disregard for business efficiency and sound economical practices?

This question has been raised in the disagreement in New York City between Robert Moses, chairman of the New York State Power Authority and Gordon R. Clapp, Deputy New York City Administrator and former TVA chairman.

Clapp, who in his TVA days once suggested that the government buy non-voting stock in private utilities to help relieve the "chronic inadequacy of power," is wrestling with inadequacy of power for New York's subways. In his first report since stepping into the job, Clapp, among other proposals, "recommended that consideration be given to the possibility of purchasing St. Lawrence power as a substitute supply for that now purchased by the Transit Authority from the Edison Company (Consolidated Edison Co of New York).

Power Loss Would Be 25% . . . Moses promptly found Clapp's "fantastic St. Lawrence scheme was without any substantial merit." Noting that St. Lawrence was being developed by the Power Authority in the interests of the people of New York State, Moses said in a letter to New York City's Mayor Robert F. Wagner:

"It should be borne in mind that this project is not being developed with public tax funds. This is a self-liquidating project which must cover maintenance and operation, interest and amortization of the bonds which are not backed by public credit. . . . It must be run in a businesslike way.

"Assuming New York City could obtain all of the St. Lawrence power, and this is a ridiculous assumption, the cost of the power by the time it reached the city would annually be almost one-half million dollars more than the cost of comparable power produced by steam within the city." He added that about 25% of the power would be lost in transmission. Moses warned city officials "this suggestion is uneconomic and if it is released, it will return to haunt you."

25 Most Thermally Efficient U.S. Power Plants

(from FPC report on plant production costs and annual production expenses)

Company	Plant	Installed Capacity (Mw)	Btu/Kwhr Net Generation
Appalachian Electric Power	Kanawha River, Glasgow, W. Va.	351.5	9,170
Indiana & Michigan Electric	Tanners Creek, Lawrenceburg, Ind.	250.0	9,329
Niagara Mohawk Power	Albany, Albany, N. Y.	240.0	9,418
Niagara Mohawk Power	Dunkirk, Dunkirk, N. Y.	160.0	9,510
Consumer Power	J. R. Whiting, Erie, Mich.	276.0	9,540
Appalachian Electric Power	Philip Sporn, Graham, W. Va.	500.0	9,594
Detroit Edison	St. Clair, East China Twp., Mich.	250.0	9,630
Cleveland Electric Illuminating	Willoughby, East Lake Village, Ohio	200.0	9,661
Consolidated Edison	Astoria, Astoria, N. Y.	180.0	9,815
Virginia Electric & Power	Portsmouth, Portsmouth, Va.	90.0	9,864
Metropolitan Edison	Titus, Reading, Pa.	225.0	9,897
Tennessee Valley Authority	Widows Creek, Stevenson, Ala.	450.0	9,934
Central Hudson Gas & Electric	Danskammer, Rosstown, N. Y.	60.0	9,942
Tennessee Valley Authority	Shawnee, Paducah, Ky.	270.0	9,952
New England Power	Salem Harbor, Salem, Mass.	150.0	9,972
Union Electric of Missouri	Meramac, St. Louis County, Mo.	110.0	10,046
Dayton Power & Light	O. H. Hutchings, Miamisburg, Ohio	360.0	10,050
Public Service Electric & Gas	Kearney, Kearney, N. J.	290.0	10,060
Southern California Edison	Etiwanda, Fontana, Calif.	220.0	10,090
Tennessee Valley Authority	New Johnsonville, Johnsonville, Tenn.	675.0	10,105
Long Island Lighting	Glenwood No. 3, Glenwood Landing, N. Y.	90.0	10,109
Cincinnati Gas & Electric	W. C. Beckjord, New Richmond, Ohio	200.0	10,209
Carolina Power & Light	Goldsboro, Goldsboro, N. C.	128.5	10,247
Illinois Power	Hennepin, Hennepin, Ill.	271.9	10,304
Wisconsin Electric Power	Port Washington, Port Washington, Wis.	400.0	10,401

"If I Were a Union Official . . ."

HARRY B. MUNSELL

If a utility president were a union official, what advice would he give a union? Harry B. Munsell, president of Kansas City Power & Light Co, recently had the opportunity to answer this question when addressing a meeting of IBEW-AFL in Kansas City. The title of his talk was "What Advice I Would Give a Union If I Were a Union Official." In view of the possible interest in this novel approach by Munsell, most of his talk is reprinted below.

There is an old Indian prayer which says, "Grant that I may not criticize my neighbor until I have walked a mile in his moccasins." While I have never been a union official, I venture to say that my experience in the field of human relations has been substantially the same as yours. I say this because there are actually no basic, fundamental differences between enlightened labor leaders and enlightened management leaders.

Men on both sides of the bargaining table have substantially the same heritage. When we are away from the bargaining table, we do not disagree in principle, in fields of government, moral standards, education, or philosophy. Even when we are at the bargaining table and in our day-to-day relations after the contract has been signed, we have a common objective—to improve our relationships and our industry.

And so I believe I have some right to tell you what I would do if I were in your position, for even though I have not actually "walked a mile in your moccasins," I think I know many of the problems of the working man as well as I know the problems of his employer.

There is a great need for more statesmanship in labor. I do not deny that there is room for improvement in management's statesmanship as well, but for the moment I am privileged to speak of labor. You have gained a place of great power in our industrial life, a place beside management, and with that power comes responsibility. Largely behind you are the struggles for recognition and union security. If you now speak with the voice of authority, do not forget the public expects more than strict partisanship from its leaders. Just as management's responsibility is not solely to the owners, a union leader's responsibility is not solely to the members of his union. I will have more to say about that in a moment.

Among the requisites for statesmanship is tolerance. Now, I know the word "tolerance" has come to have an unpopular meaning when used in certain ways. The word sometimes connotes toleration—putting up with something unpleasant. I do not use the word in that sense; I use it in the sense of patience and understanding. What I mean by "tolerance" is the disposition to understand and make allowances for the beliefs, practices, or habits differing from one's own. In short, it is the willingness to admit that there may be more than one viewpoint, honestly held, respecting a given situation.

In the specific field in which we are both concerned, I would, if I were in your position, be more tolerant of the beliefs, practices, and habits of those on the management side of the table. I would try to make myself realize that management makes mistakes, sometimes deliberately by supervisors who do not share top management's views regarding labor relations, but in the overwhelming majority of cases they are honest mistakes. I would school myself to make allawances for management's mistakes and not be too hasty in name-calling and insinuations.

These do not solve problems; they only aggravate them. Do not always look for an ulterior motive. Unions make mistakes too and since you expect tolerance from management, be prepared to show it yourself.

I would try to understand why management makes mis-

takes, and once I understood that, I believe I could be helpful to management in preventing the same mistake again. I would try to understand, for instance, that the average large corporate employer has a very complex organization, one that is usually trying hard to meet the demands of a very sensitive and discriminating public. Management today carries an enormous work load which sometimes results in the short-cutting of human relations problems.

I would also try to understand and to be tolerant of the communications problem which confronts the management executive exactly as it frequently confronts, and sometimes frustrates, the union executive. I would try to realize that top management in some instances has much the same difficulty in getting across its ideas of good employer-employee relations to lower levels of supervision as does the top brass of union leadership in relation to its various locals and their members.

And finally, I would be tolerant of the small number of strong-minded and perhaps well-meaning individuals in the employer group who are unable to learn or to follow modern labor-management relations. I would not permit an annoying incident or experience to spark serious labor strife.

And now if I may assume that you are all going to be more tolerant of human errors, even those of management, I will move to another, and possible more important aspect of labor statesmanship, which I refer to as "economic responsibility."

Aim For Real Wages

I do not deny that there may be cases where an increase of wages is justified—such as where wage rates are out of line with wages paid for the same work by other employers similarly situated, or where there are recognized inequities among job classifications. But, I ask you to recognize that the true measure of wages is not dollars themselves but what those dollars will buy in food, clothing, shelter and some of the luxuries of life. In other words, make your objective real wages rather than dollar wages.

It is entirely proper for you to press for higher wages in order to improve the standard of living of the American worker. There is no one in this room who wants more than I to improve the standard of living of every American. But remember that the only way to raise this standard generally is through increased productivity. When wage increases outstrip productivity, the inevitable result is a spiral of increasing prices which we call inflation.

Responsible labor leaders should be just as interested in preventing further inflation in this country as any other segment of our society. Certainly the working man has much to lose from inflation and his leaders have a grave responsibility here not to sell out his long-term welfare by demanding wage increases which cannot be justified.

However, you must realize that all of the awards of increased productivity are not automatically the property of labor. The investors who have put their money into the business enterprise to make possible the purchase of more efficient machines and equipment are certainly entitled to their rightful share. Likewise the public, the customers who buy the product, must benefit by a reduction in price.

I do not know exactly how these rewards should be divided, but I would not, if I were a union leader, insist on an unreasonable share for labor. I would work intelligently with management to arrive at a satisfactory and fair division.

For my final suggestion: If I were an official of the International Brotherhood of Electrical Workers, I would urge my constituents to give up voluntarily the right to strike against a public utility employer. I would sit down with management and help write the strongest no-strike clause that could be conceived by the human mind—one that was final and absolute.

I would also set in motion whatever would be necessary to discipline any member of the union who advocated or participated in a wildcat strike, and I would enforce that discipline regardless of the circumstances or the consequences. In other words, I would make it absolutely unprofitable, if not impossible, for a public utility employee to engage in a work stoppage of any kind at any time.

Settling Disputes

I realize that if a union is asked to surrender voluntarily its right to strike, it has a right to demand some forum before which it can present its grievances, its wage demands, and its contract proposals.

Those of you who know me well must know by this time that I am no advocate of the type of compulsory arbitration which we generally find in collective bargaining agreements today. I am not in favor of compulsory arbitration in any form if it involves the settlement of management-labor disputes by "disinterested third persons."

My greatest objection to this procedure is not that "disinterested third persons" are dishonest or incapable; my objection is, first, that they are disinterested and, second that they are third persons—that is, outsiders who know little or nothing about our business.

If I were an IBEW official, I would want to find a way to settle management-labor disputes peacefully through some method where differences can be resolved fairly by persons who are:

1. Interested in the welfare of both labor and management, and,

2. who are actually in our business. In other words, I would want to make my case before a forum which was both interested and informed.

I have no clear cut ideas as to how this could be accomplished, but I am convinced that it can be accomplished if both labor and management really want it.

In the public utility field labor as well as management has a responsibility to the public, which, to state an old cliche, "is bigger than both of us." In modern society where any interruption of utility service causes severe hardship to the public, neither of us has any right to use economic warfare as a weapon for settling our disputes at the expense of suffering by the general public.

A better way must be found, and it is up to us to find it, not only because that will be real labor-and-management statesmanship but also because the public will not stand for much temporizing with the problem.

If instances arise where we cannot bargain out a problem, I suggest the dispute be taken before a forum, consisting of those who are intimately connected with our industry and who would assure both sides fairness and impartiality—a forum which would help us solve our problems on the basis of what is best for both of us. Once we have accomplished this, we can proudly say that both labor and management, in at least one industry, have grown up.

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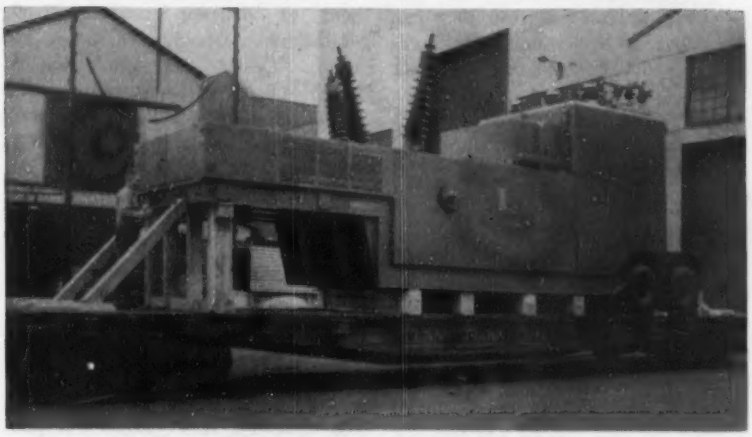

H-V Mobile Substations Shipped

Three mobile 5,000-kva substations were recently shipped by Westinghouse Electric Corporation to the Bureau of Reclamation. Mounted on highway-type trailers, the substations will be used mainly in California, Colorado, and Wyoming for temporary power at construction sites, and for emergency power. They will transform from 110 kv to 2400/4160 v wye or 7200/12470 v wye. The low-voltage circuit breaker has interrupting capacity of 1,000 Mva at 12,470 v. Overall dimensions are: length, 35 ft; width, 108 in.; height, 166 in. Weight for highway transit is 77,500 lb.

GE Receives Order for The Dalles Generators

General Electric Co received an $11 million order to supply eight 78,000-kw hydraulic turbine-generators for the Dalles dam, a U. S. Army Corps of Engineers project on the Columbia River. Shipment of the first unit is scheduled for September 1956 and the eighth unit is scheduled to be shipped in October 1958. Initial generation is scheduled for Nov 1, 1957, at present.

GE's bid for the units was $11,114,620. Second low bidder was English Electric Import and Trading Co, New York City, with an offer of $13,277,268. Third low bidder was Tokyo Shibaura Electric Co, Ltd, Tokyo, with $13,895,847. Fourth low bidder was Allis-Chalmers Mfg Co with $13,939,110.

A GE spokesman said the machines for the Dalles project are similar to 12 generators now being supplied for the McNary dam. Five of the McNary machines are already in operation. Number 6 and 7 machines are in the process of erection.

Of the 14 units scheduled for McNary, GE is supplying 12. English Electric Import & Trading Co will supply the remaining two machines.

Aluminum Production Up

U. S. primary aluminum production, according to the Aluminum Association, was 125,089 tons in October. This is almost a 4% increase from 120,332 tons in September and about 15.6% increase over 108,219 tons in October 1953. Total production this year through October was 1,212,278 tons, compared to 1,036,086 tons for the same period in 1953. All-time record month was last July when 126,162 tons were produced.

Control Co's Plan Merger

Burgess-Manning Co of Libertyville, Ill, and Penn Industrial Instrument Corp of Philadelphia plan a merger, subject to approval of shareholders of both companies. The latter will operate as a division of the former. Penn Industrial products are electronic flow meters and temperature and pressure control instruments. Burgess-Manning has sound control and surge devices, sound absorbing telephone booths and a ceiling panel that provides radiant heating, cooling and acoustical control.

Preformed Products to Open California Plant

Preformed Line Products Co, Cleveland, has leased 5.5 acres in the light industrial tract at Stanford University, Palo Alto, Calif, and will start work immediately on a $350,000 plant to serve as its western headquarters.

The 23,000 sq ft building, designed and to be constructed by The Austin Co of Oakland, is scheduled for completion within six months.

About one fourth of the company's $3 million annual sales volume of power line equipment, now being shipped from Cleveland, will be handled in the new plant. Among the firm's major Pacific Coast customers are Pacific Gas & Electric, Southern California Edison, and Portland General Electric.

Thomas F. Peterson, company president, has established a $10,000 research project at Ryan High Voltage Laboratory at Stanford under the direction of Prof Joseph S. Carroll. The project will be coordinated with production activity at the plant.

Opens Hot Rolling Mill

Multipurpose hot rolling mill put into operation by Carpenter Steel Co, Reading, Pa., is said to be the first mill for the production of strip, rods, and bars on one combined mill layout. According to Frank R. Palmer, president, the mill is specially designed and laid out to meet all the requirements involved in producing a wide range of specialty steel products, including tool, stainless, and alloy steels.

The mill is 100% electrified, and covers an area of 125,750 sq ft. Individual drives and motors on each stand permit rolling within a close temperature range from billet to finished product. This results in closer end-to-end tolerance, more uniform

size, and greater uniformity in ultimate structure.

Full operation of the 10, 12, 14, 18, and 20 inch stands requires 9,500 hp. Continuous production is assured and shutdown time limited by integrating all maintenance facilities under one roof.

Besides production flexibility, the mill incorporates improved heating facilities that aid in controlling surface decarburization. All reheating furnaces are oil-fired and equipped with automatic controls.

To facilitate operation and maintain steady production, a modern two-way communications system allows the man at any operating pulpit to transmit a message that will be heard throughout the plant.

Delta-Star Wins Crate Prize, Saves 106 lb

Delta-Star Electric Division of the H. K. Porter Co won the first prize in the wirebound box and crate division of the 1954 Protective Packaging and Materials Handling Competition in Chicago. Here J. C. Hydrick (left) works manager of Delta-Star explains to L. S. Beale, secretary of the Association, some of the superior points of the prize-winning crate.

The crate contains a 591-lb high-voltage disconnect switch. In making his entry, Hydrich wrote that "the redesign of this crate from a bulky custom-made wood box to a standardized wirebound crate saved 106 lb per unit in the gross shipping weight" and reduced packing man-time from 3.5 hr of skilled labor to 0.5 hr of unskilled labor.

A feature of the prize-winning wirebound crate is its use for two different sizes of high-voltage disconnect switches simply by reversing the bottom support pieces, which are prenotched on both edges so they can be used to fit either unit. The hold-down assembly is made for the larger unit, but is simply cut down for the smaller one. The skid base permits economical handling by industrial truck, whereas overhead cranes formerly had to be used.

Asbestos Mines Opened

Johns-Manville Corp formally put two Southern Rhodesia mines into commercial production late in November. This was reflected in the official opening of a new central mill that has initial capacity of 20,000 tons of fiber annually. The two mines under development are the Temeraire mine at Mashaba and the Shamala mines, four miles away.

MANUFACTURING BRIEFS

Business men expect upturn for the first quarter of 1955, according to a Dun & Bradstreet survey. Among over 1,300 executives of large and medium manufacturers, 56% look to higher sales and 43% expect larger net profits. Lower sales are anticipated by 13% and smaller net by 12%. No change in sales is expected by 31%, and 45% believed the level of earnings will be the same.

Kuhlman Electric Co consummated the purchase of State Metal Fabricators Inc of Salinas, Calif, on Nov. 15. This plant addition (EW, Nov. 15, p. 184) will about double the present floor space and provide western facilities for production of distribution transformer.

Microswitch has opened a new research and product development center in Denver, Colo. The center, located at 387 Corona St, will supplement activities of Microswitch's main office in Freeport.

U. S. copper deliveries to fabricators were 105,293 tons in October, according to a completed tabulation by the Copper Institute, New York. This is an increase of 16,095 tons over the year's low of 89,198 tons in September (EW, Nov. 29, p. 134).

Exhibition. Eastern Joint Computer Conference and Exhibition will be held at Bellevue-Stratford Hotel, Philadelphia, December 8, 9 and 10, 1954. "Design and Application of Small Digital Computers" is the theme. Mail registration and requests for material should be addressed to P. O. Box 7825, Philadelphia 1, Pa.

A $8.5-million Federal-aid program designed to prevent surface water from flooding Pennsylvania anthracite mines, has been proposed by Sec. of Interior Douglas McKay and Sec. of Commerce Sinclair Weeks.

Lincoln Electric Co's vice president and secretary, A. F. Davis was presented the Samuel Wylie Miller Memorial medal for outstanding contributions to the advancement of welding, at the recent National Fall Meeting of the American Welding Society in Chicago.

Wyle Research Corp, El Segunda, Calif., has developed test facilities for vibration analysis of electrical and electronic components such as motors, switches, relays, transformers, condensers, as well as systems such as camera control and radar.

Radio Corporation of Amercia is studying a course of action on a civil complaint filed recently by the Anti-trust Division of the Department of Justice. The complaint relates to monopolizing of patent rights on radio and television developments. RCA pointed out that the agreements upon which the complaint is based are the same which were approved by the courts and the Government in 1932 and have since been twice unheld by the courts, once in 1942 and again in 1954.

General Electric Co has opened a $3.5 million turbine development laboratory at Schenectady. Ebasco Services, Inc, of New York supervised design and construction. . . . Industry-standard apparatus bushings are being furnished on GE oil circuit breakers, power transformers, regulators, and oil-filled reactors ordered after Oct. 1. . . . GE plans to waive provisions of its pension plan to enable its 14,000 pensioners tc benefit by the recently increased Social Security payments. Employees who retired before Social Security benefits became payable will receive a $7 increase.

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MP&L's Refinancing Approved

Plan, okayed by SEC, calls for Southern utility to issue 44,476 shares of new 4.56% for $6 preferred now outstanding

R. BAXTER WILSON

The Securities and Exchange Commission has approved Mississippi Power & Light Co's refinancing issue of 44,476 shares of $100 par value preferred stock. The new 4.56% issue is being offered in exchange for a corresponding number of outstanding $6 preferred stock, plus a cash payment of $5.00 a share, being the difference between the initial public offering of $105 a share and the redemption price of $110 on the $6 preferred stock. R. Baxter Wilson is the president of MP&L.

The stock issue has figured in one of the hottest political debates of the decade—the so-called Dixon-Yates controversy. MP&L is an operating subsidiary of the Middle South Utilities, Inc, which is purchasing 79% of the newly created Mississippi Valley Generating Co common stock. The Southern Co will buy other 21%.

A few months ago, when MP&L asked SEC approval of the stock issue, J. D. Steitenroth, then secretary-treasurer of MP&L, broke loose from the firm with the charge that it was being used by Middle South's Wall Street officials to milk the people of Mississippi. His charges were aired at length before Sen William Langer's anti-monopoly subcommittee at the height of the Dixon-Yates battle.

Amended Prospectus . . . MP&L subsequently amended its prospectus to reply to Steitenroth. It counter attacked, branding Steitenroth's statements untrue. Nevertheless, SEC took no chances and instituted a more-than-usually-thorough examination of the company's records in the light of the charges of the financial officer, who was fired the day after he blasted his firm.

SEC undertook on-the-spot studies, discussing the stock plan and Steitenroth's charges with company employees in Mississippi, and checking the books.

The thoroughness of the SEC investigation is illustrated by the fact that, while MP&L asked for approval by Oct. 14, the regulatory agency has just satisfied itself that there is no reason to withhold approval. Of the financing, an SEC spokesman said, "Based on a thorough consideration of all the facts known to the commission, including a study of the Steitenroth charges, the commission has concluded that there was no reason to believe that the Mississippi Power registration statement, as now amended, is inaccurate or incomplete in material respects."

Calelec Plans to Buy Riverside's Light Unit

California Electric Power Co, headquartered in Riverside, Calif., has offered to purchase Riverside's Municipal Department of Light for some $6 million.

The proposal has been referred by the Riverside City Council to the city's Board of Public Utilities for study and recommendation. For the sale to go through, the council would have to vote 5-2 to submit it to the city's voters. An election on the issue would probably take place sometime next spring.

If the sale is consummated, Calelec will build its proposed new $1,840,000 office building in Riverside, rather than in the city of San Bernadino, Calif., as originally planned. Calelec's eight-county service area includes the area surrounding Riverside, but not the city itself. The utility's board of directors also decided the company should be headquartered in a municipality that it serves.

FINANCIAL BRIEFS

Yankee Atomic Electric Co has asked Massachusetts Department of Public Utilities approval to issue 3,175 shares of $100 capital stock. William Webster, executive vice president of New England Electric System and president of Yankee Atomic, said the issue will finance engineering studies and preliminary expenses. Larger capital will be necessary, Webster added, if plans to establish an atomic electric plant in this area are successful.

Commonwealth Edison Co has reported that more than 4,000 of its employees are participating in the company's recently initiated employee stock purchase plan.

International Bank for Reconstruction & Development has made a $16.2 million loan to finance the foreign exchange costs of a thermal electric power plant in Bombay, India, for Tata Hydro-Electric Supply Co, Andhra Valley Power Supply Co, and Tata Power Co. The National City Bank of New York has agreed to participate in the loan, without the International Bank's guarantee, to the extent of $1,364,000.

Private Sales . . . Kansas Power & Light Co has sold $8 million 3⅛% first mortgage bonds due 1984 to 13 institutions . . . Portland General Electric Co has sold $12 million first mortgage, 3⅜% bonds due 1984.

Dividend Increases . . . Texas Utilities Co will pay Jan. 3 a quarterly common stock dividend of 58¢ a share as compared with 52¢ a share previously . . . Tucson Gas, Electric Light & Power Co will pay Dec. 22 a quarterly common stock dividend of

26¢ a share versus 23¢ in previous quarter . . . Citizens Utilities Co will pay Dec. 28 a quarterly common stock dividend of 3% in stock and a regular 12¢ a share in cash. Total dividends in 1954 will total $1 a share including a value of 52¢ which the company has placed on the stock dividend as compared with 40¢ a share in cash, plus a 3% stock dividend valued at 45¢ in 1953.

Iowa Public Service Co has received Federal Power Commission approval to split its common stock on a two-for-one basis.

Quebec Power Co is offering its stockholders rights to purchase one new common share at $23 for each five existing shares they hold of record Nov. 10. The offer expires on Dec. 15 . . . Royal Securities Corp is offering $2.5 million Newfoundland Light & Power 4½% general mortgage sinking fund bonds due in 1974 at par.

Pacific Power & Light Co has asked the Wyoming Public Service Commission for amendments in the operating certificates to give it the right to serve 66 more townships in Natrona and Converse counties along the route of a proposed transmission line leading to Lake DeSmet.

Blyth & Co, Inc, 14 Wall Street, New York, has issued an interesting booklet entitled "An Analysis of Portland General Electric Co."

Federal Power Commission has issued its 1953 edition of "Statistics of Electric Utilities in the United States." Copies, at $6 each, are available at FPC's Publication Division. Order number is FPC S-112. The 24-page summary section may be obtained separately in pamphlet form at 25¢ a copy.

Appalachian Electric Power Co has received West Virginia Public Service Commission approval to buy four small electric distribution systems in southern West Virginia for $25,390.

Tampa Electric Co stockholders have approved a three-for-one stock split . . . Blyth & Co has sold a secondary offering of 20,000 shares of common stock of Portland General Electric Co at $21.50 a share.

Today in Utility Finance

YIELDS (%)

Quality	Bonds			Preferred Stocks			Common Stocks		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
DATE									
Nov. 25	**2.88**	**2.91**	**3.08**	**3.87**	**4.02**	**4.37**	**4.45**	**4.80**	**5.19**
Nov. 18	2.89	2.91	3.11	3.88	4.04	4.38	4.51	4.82	5.18
END OF QTR.									
3rd 1954	2.88	2.90	3.10	3.89	3.99	4.38	4.50	4.80	5.19
2nd 1954	2.90	2.96	3.19	4.03	4.14	4.48	4.72	5.04	5.45
1st 1954	2.82	2.87	3.14	3.88	4.00	4.42	4.83	5.19	5.42
4th 1953	3.07	3.12	3.34	4.17	4.32	4.62	5.07	5.57	5.51

Data: Reis & Chandler, Inc.

EARNINGS

Company	Period Months Ended		Net Income 1954	Net Income 1953	Earnings per Common Share 1954	Earnings per Common Share 1953
Alabama Power	12	Oct.	$13,796,063	$12,704,205	$.....	$.....
Arkansas Power & Light	12	Oct.	8,153,039	6,344,076	.....	.....
California Electric Power	12	Sept.	2,557,026	2,787,876	0.75(a)	0.89(a)
Central Vermont Public Service	12	Oct.	1,230,510	984,090	1.12(b)	0.97(b)
Cleveland Electric Illuminating	12	Sept.	14,206,963	14,698,800	3.90	4.05
Consumers Power	12	Oct.	26,426,647	23,904,237	3.13(b)	3.09(b)
Detroit Edison and subsidiary	12	Oct.	21,369,809	21,274,826	1.99(b)	2.05(b)
Georgia Power	12	Oct.	13,546,507	12,517,053	.....	.....
Houston Lighting & Power	12	Oct.	13,055,767	10,281,953	2.40	1.98
Idaho Power	12	Sept.	4,734,796	4,541,948	3.54	3.39
Iowa Southern Utilities	12	Oct.	1,145,196	1,396,130	1.37(c)	1.99(c)
Kansas City Power & Light	12	Oct.	7,026,816	6,521,312	2.31(f)	2.42(f)
Minnesota Power & Light	12	Oct.	3,500,885	4,008,314	1.74	2.00
Montana Power and subsidiaries	12	Oct.	7,565,679	7,688,147	2.61	2.71
New York State Electric & Gas	12	Oct.	9,357,005	8,779,264	2.58	2.45
Ohio Edison and subsidiary	12	Oct.	19,933,574	18,717,085	3.00(b)	3.10(b)
Portland General Electric	12	Oct.	4,214,025	3,770,267	1.40	1.26
Southern Co, consolidated	12	Oct.	23,599,118	21,990,060	1.30	1.21
Southern Indiana Gas & Electric	12	Oct.	2,372,684	2,150,101	2.15(g)	2.17(g)

Notes—(a) Based on 2,670,000 shares in 1954 and 2,500,000 shares in 1953; (b) Based on average shares outstanding; (c) Based on 745,431 shares in 1954 and 630,125 shares in 1953; (f) Based on 2,450,000 shares in 1954 and 2,224,540 shares in 1953, and (g) Based on 913,333 shares in 1954 and 799,167 shares in 1953.

FINANCING

Company and Description	Amount of Offering (000)	Offering Price	Yield to Public / Bid Date
WEEK OF NOVEMBER 25-DECEMBER 1			
Bonds			
Public Service Co of New Hampshire—1st mtg 3¼% due 1984	$12,000	102.75%	3.11%
Preferred Stock			
Interstate Power—200,000 sh 4.36% $50 par	$10,000	$51.05	4.27%
Mississippi Power & Light—44,476 sh 4.56% $100 par (being offered in exchange for outstanding $6 pfd on a sh-for-sh basis, plus a cash difference between initial public offering price of new shares and redemption of the old shares; offer expires Dec. 20)	4,670	105.00	4.34%
SCHEDULE FOR NOVEMBER-DECEMBER-JANUARY-FEBRUARY			
Bonds and Debentures			**Bid Date**
Long Island Lighting—1st mtg due 1984	$15,000	.....	Dec. 7
New Orleans Public Service—1st mtg due 1984	6,000	.....	Dec. 14
Puerto Rico Water Resources Authority—electric revenues due 1957-90	12,500	.....	Dec. 14
Commonwealth Edison—conv. debs	50,000*	.....	Jan. 11
New England Power—1st mtg due 1985	25,000	.....	Jan. 18
Los Angeles, Calif., Department of Water & Power—electric plant revenues	18,000	.....	Jan. 26
Kansas City Power & Light—1st mtg due 1985	15,000	.....	Feb. 15
Duke Power—1st mtg due 1975	40,000	.....	.....
Western Light & Telephone—1st mtg due 1985	3,000	.....	.....
Preferred Stock			
Central Power & Light—75,000 sh $100 par cum	$7,500	.....	Dec. 7
Patchogue Electric Light—750 sh $1,000 par	750	.....	.....
Public Service Electric & Gas—250,000 sh $100 par cum	25,000	.....	Jan. 11
Common Stock			
Duke Power—218,737 sh (to be offered commonholders on 1-for-20 basis without underwriting)	.....	.....	.....
Western Light & Telephone—about 40,000 sh (to be offered commonholders on a 1-for-10 basis)	.....	.....	.....
ISSUES RECENTLY POSTPONED			
Bonds			
Gulf States Utilities—1st mtg due 1984	$24,000	.....	.....
Consolidated Edison Co of N. Y.—1st mtg due 1984	50,000	.....	.....
Preferred Stock			
Gulf States Utilities—160,000 sh $100 par cum	16,000	.....	.....
UNSCHEDULED AND/OR UNDER CONSIDERATION			
Bonds and Debentures			
Connecticut Light & Power—1st mtg	$10,000	.....	.....
Kentucky Utilities—1st mtg	15,000	.....	.....
Duke Power—1st mtg due 1975	40,000	.....	.....

Notes—* Estimated.

'Buy American'

Trade policy issue still unsettled. Eisenhower's cabinet will study whole matter again

The President called last March for wiping out "Buy American" preferential bidding except where unemployment in the U. S. or the national security was at stake. The Administration has been wrestling ever since with the problem. An executive order was slated to go into effect a short time ago drastically reducing the preferential margin under the Buy American Act. But under pressure from interested American firms the whole matter now has been referred back to the cabinet again for further study.

Odds are though that Buy American policy will be liberalized by the White House before the end of the year. It already has been relaxed in specific cases. A number of contracts have been granted to foreign firms recently whose bids were as little as 12% below the lowest American bids.

New Formula Popular . . . The new price adjustment formula to replace the price escalation clause in government contracts which proved so successful for General Electric Co in a recent generator procurement action for the Dalles Dam (EW, Oct. 18, p 105) is catching on fast.

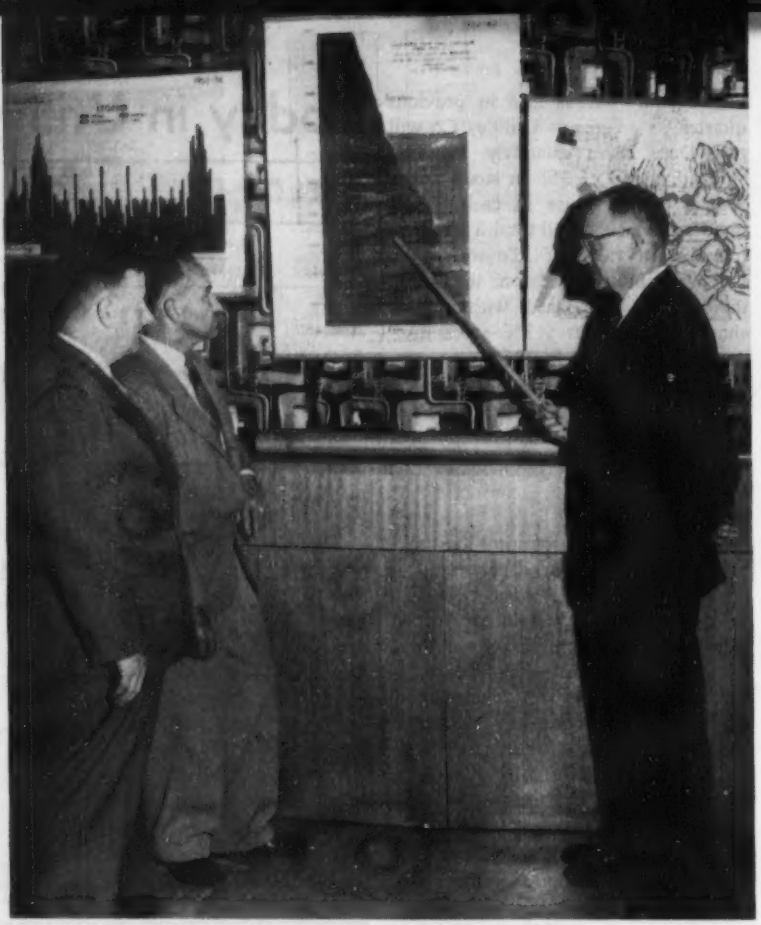
GE underbid U. S. and foreign bidders with an offer of $11,115,620 for eight large generators in that procurement, and the company is planning to keep an eye on how that contract operates between now and delivery dates several years off. The company is far from sold on the idea of substituting the index system, which has found high favor among government agencies, but it has not written it off completely. It has been eyeing the method for some years as a possibility in apparatus contracting, but not with any outward display of emotion.

Interest Reported . . . Despite this, government officials who fancy the idea of switching to an index are convinced that General Electric and other firms are very interested in the plan. They mention steam turbines and transformers as areas of business some firms have earmarked for index-style bidding.

The method is simple: Instead of including in a bid a percentage of costs and profits as a margin for increases in costs, the manufacturer-bidder computes merely his materials and wages costs, and his profit margin, in his bid, leaving cost increases tied to fluctuations in a special index prepared in conjunction with, and operated by, Bureau of Labor Statistics.

This results in a bid reduced in direct relation to the amount ordinarily incorporated for contingencies.

Bureau of Labor Statistics is proud of its indexes, but it also points out their limitations. The agency feels escalation on this basis is a true reflection of cost increases, and therefore a windfall profit preventive. However, it also realizes that in adopting special indexes based on only a few materials costs, reliable variables—such as fluctuations in price levels throughout the nation—are lost to a large extent.



J. FRANK WARD (right) uses chart to show Walter Gordon, Washington State Power Commission chairman, and Harry Hudlow, Franklin PUD, steam power needs in Northwest

Steam Power Need in Northwest Foreseen

Steam plants will be needed in the Pacific Northwest by 1960 to provide a supplementary power source, said J. Frank Ward, managing director of Washington State Power Commission, at a meeting with PUD members in Pasco, Wash. Although the area has more than one-third of the nation's hydroelectric potential, steam-burning plants may provide up to 25% of the total power requirements in the next decade, he felt. Only 10% of the present energy needs are met by steam.

Future steam plants are required, Ward reported, primarily to firm up secondary or interruptible hydro power. By 1962, he sees the need for 1.4 million kw of steam-electric generation. Upstream storage on the Columbia River would not solve the problem because storage would add more secondary power to be firmed up.

SYLVANIA ANNOUNCES

THE NEW SUPER DELUXE FLUORESCENT LAMP

Makes Merchandise Look More Colorful and Attractive

Sylvania's new Super Deluxe fluorescent lamps are the answer to your problem of showing merchandise at its most colorful best. These new lamps give the best overall rendition of color yet achieved by fluorescent lamps, not only improving the appearance of the merchandise being displayed, but also giving a more flattering appearance to customers and sales people.

This new lighting tool can mean dollars and cents to all sellers of goods to whom attractive appearance of merchandise means more sales.

For full details on this new Super Deluxe fluorescent lamp, write for Booklet Fl-532, Sylvania Electric Products Inc., Dept. 4L-2831, 1100 Main St., Buffalo 9, N. Y.

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ELECTRICAL BUSINESS OUTLOOK

Residential Sales: Still Improving

The outlook for residential electric power sales in 1955 is still improving. The latest bright note is provided by the Survey Research Center at the University of Michigan. The Center's latest survey of consumer attitudes shows that consumers are in a better mood for buying appliances and other major household goods than they have been for a couple of years.

Past surveys by the Survey Research Center have been highly successful in indicating the future course of consumer buying. So the survey's findings are an especially encouraging sign for prospective sales of appliances.

Specifically, the survey discloses that consumers feel better about the business situation than they have for two years. And a very substantial majority of families seem to think this is a good time to buy appliances and other major household goods. This survey was made in October, and its results naturally reflect people's feelings then—and not necessarily today. But the chances are that, with business improving, they feel even better today.

Result of Previous Survey . . . Consumer optimism about the business situation hit a peak in late 1952. A survey in Nov.-Dec., 1952, showed that 56% of families thought that business would be good for the next year. Only 6% expected bad times in the next year. These results, along with the rest of the survey results, foretold the good sales of appliances, automobiles and houses that marked 1953.

But by late 1953, people felt much worse about business prospects. Only 47% expected good times, and fully 19% thought that times would be bad in the next year. And this result was one indicator that sales to consumers might not be as good in 1954 as in 1953. Although sales were expected to stay high, it seemed likely that they would decline somewhat (EBO, Dec. 7, 1953, p 50).

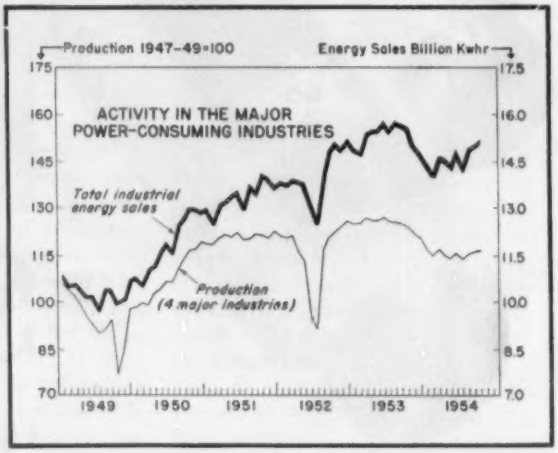
A survey this June showed consumers feeling somewhat better; and now they apparently feel better still about their chances for getting ahead in a good business climate over the next year. No one really knows just how important this feeling of confidence is in getting consumers to spend their money. But, to the extent that it is important, it is obviously becoming a more favorable factor in the business outlook.

A much larger proportion of families also think that now is a "good time to buy" large household goods (See chart). A lot of them seem to think that prices have come down, and may now be stable. The feeling that it's a good time to buy is also a favorable factor for consumer buying.

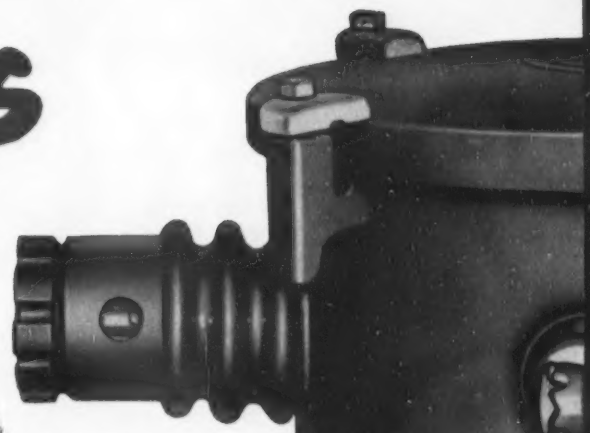
Families Better Off Financially . . . Consumers also feel better off, financially, than they did in recent surveys. Thirty per cent of families said that they had improved their financial situation in the past year. A year ago, only 26% felt better off. And in the higher income group ($5,000 a year and up) and even higher percentage feel better off. This is important, in view of the fact that these higher income people buy a big proportion of houses, household goods and automobiles.

The survey results are especially encouraging because they come on top of a whole series of news items favorable to residential power sales in 1955. One of these is, of course, the general upturn in business this fall. Better business means better incomes and higher consumer spending. Personal income went up by $2 billion (at annual rates) in September, and has undoubtedly risen since.

In addition, the rate of installment buying—a key factor in appliance sales—is picking up. And the homebuilding industry is apparently heading into another period of real boom (EBO, Nov. 22, p 66). Any one of these news items would be favorable. Taken together, they indicate a fast start for residential power sales in 1955.



TOPS IN BOTTOMS



Distribution transformers are subject to weather and handling hazards both on the line and in storage. Constant exposure to abuse from man and weather makes protection difficult. Transformers are particularly vulnerable at the base, where moisture from condensation or rain will cause rust that attacks any unprotected point.

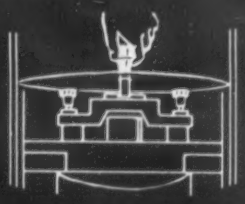
Moloney HiperCore Transformers are *tops in bottoms.* Their rugged shells are designed to stay in use despite weather and abuse. Moloney HiperCore Transformer Tanks are protected against rust forming at the base weld . . . and feature a rolled lip which prevents deterioration from weather or water. The tank base is first pressed into the shell and is bonded into a unit by a continuous seam weld. The inside edge, the only point where water might stand, is coated with a sealing mastic and rolled in, forming a lasting barrier against moisture, air, and the ravages of rust.

So, give your distribution system the advanced engineering, design, and fabrication that is synonymous with Moloney Products *all along the line.*

ME54-29

Corprene gasket retained by ring welded to tank cover. Gasket is retained in position forming a perfect tank seal. Gasket is not cemented and may be used again and again.

Moloney sidewall mounted high voltage bushings are provided with a molded, high impact resistant phenolic-cold rubber protective cap for sporting "hot" spots.



Tap changer operating handle located above top of cover. Double-acting contacts positive with a wiping action that assures positive contact.

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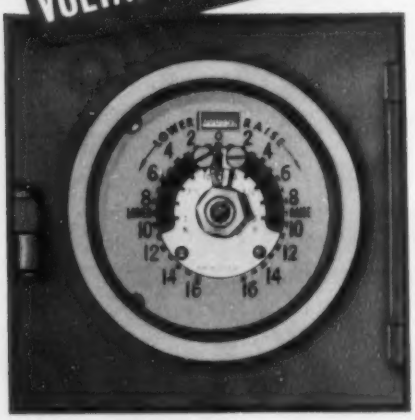
Utility Engineer Says:

"Vari-Amp Feature Lets Relay Man

Change Ratings on Two Regulator Banks In 15 Minutes"



NO NEED to take regulators out of service when you change ratings on an Allis-Chalmers single-phase power regulator. Three simple steps is all it takes to do the job fast. They replace the 10 complex, time-consuming operations required for other types of regulators. There are no electrical connections to make — no complicated adjustments.

Five Ratings in a Single Regulator

In addition to simplifying operation, the *Vari-Amp* feature provides five ratings in a single regulator. You can meet regulation requirements at less expense in most cases. When loads grow, changes cost less because range of regulation can be reduced proportionately instead of being cut in half as with other regulators. Extra short-circuit capacity is available, too.

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A-4460

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Change Ratings

1. Open Window
2. Place Limit Switch Pins in Desired Positions
3. Close Window

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